

UNCLASSIFIED

AD NUMBER
AD883980
NEW LIMITATION CHANGE
TO Approved for public release, distribution unlimited
FROM Distribution authorized to U.S. Gov't. agencies only; Proprietary Information; APR 1971. Other requests shall be referred to Air Force Weapons Lab., Kirtland AFB, NM.
AUTHORITY
AFRL-SUR ltr, 29 Aug 1986

THIS PAGE IS UNCLASSIFIED

AD 883 780

AUTHORITY:

AFW & Ctc,

7 Nov 86



**THIS REPORT HAS BEEN DELIMITED
AND CLEARED FOR PUBLIC RELEASE
UNDER DOD DIRECTIVE 5200.20 AND
NO RESTRICTIONS ARE IMPOSED UPON
ITS USE AND DISCLOSURE.**

DISTRIBUTION STATEMENT A

**APPROVED FOR PUBLIC RELEASE;
DISTRIBUTION UNLIMITED.**

✓
AFWL-TR-70-170

2
AFWL-TR-70-170

AD883980

ANALYSIS AND FULL-SCALE TESTING OF AN AIRCRAFT SHELTER

Jimmy H. Smith

The Eric H. Wang Civil Engineering Research Facility

University of New Mexico

TECHNICAL REPORT NO. AFWL-TR-70-170

April 1971

AD No. _____
DDC FILE COPY

AIR FORCE WEAPONS LABORATORY

Air Force Systems Command

Kirtland Air Force Base

New Mexico



Each transmittal of this document outside the agencies of the U. S. Government must have prior approval of AFWL (DEZ) 87117, Kirtland AFB, NM,

UNCLASSIFIED
Security Classification

DOCUMENT CONTROL DATA - R & D		
(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)		
1. ORIGINATING ACTIVITY (Corporate author) The Eric H. Wang Civil Engineering Research Facility University of New Mexico Albuquerque, New Mexico		2a. REPORT SECURITY CLASSIFICATION Unclassified
		2b. GROUP
3. REPORT TITLE ANALYSIS AND FULL-SCALE TESTING OF AN AIRCRAFT SHELTER		
4. DESCRIPTIVE NOTES (Type of report and inclusive dates) July 1968 through October 1970		
5. AUTHOR(S) (First name, middle initial, last name) Jimmy H. Smith		
6. REPORT DATE April 1971	7a. TOTAL NO. OF PAGES 174	7b. NO. OF REFS 10
8a. CONTRACT OR GRANT NO. F29601-68-C-0009 ✓ b. PROJECT NO 5713 and 683M c. d.		9a. ORIGINATOR'S REPORT NUMBER(S) AFWL-TR-70-170 9b. OTHER REPORT NO(S) (Any other numbers that may be assigned this report)
10. DISTRIBUTION STATEMENT Each transmittal of this document outside the agencies of the U. S. Government must have prior approval of AFWL (DEZ), Kirtland AFB, NM 87117. Distribution is limited because of the technology discussed in the report.		
11. SUPPLEMENTARY NOTES	12. SPONSORING MILITARY ACTIVITY AFWL (DEZ) Kirtland AFB, NM 87117	
13. ABSTRACT (Distribution Limitation Statement No. 3) The objective of this research was to determine the response of a semicircular orthotropic steel shell aircraft shelter when subjected to symmetric and unsymmetric static load conditions. A numerical technique is presented which is capable of treating the problems of nonlinear material properties, nonlinear geometry, flexure and axial compression, and the orthotropic nature of the structure. Basically, a mathematical model is developed which exhibits the same characteristics (moment-rotation, load-deformation, and ultimate strength) as a finite portion of the actual structure. This information is then used as input to a digital computer program for proper assembly of the stiffness coefficients and subsequent solution. The method of analysis is based on a differential approach to the basic displacement method, and a fourth-order Runge-Kutta integration technique is employed to integrate the differential equations. To verify the analysis, 22 tests were conducted on a full-scale structure which compared favorably to the numerical analysis.		

DD FORM 1473
1 NOV 65

UNCLASSIFIED
Security Classification

AFWL-TR-70-170

AIR FORCE WEAPONS LABORATORY
Air Force Systems Command
Kirtland Air Force Base
New Mexico 87117

When US Government drawings, specifications, or other data are used for any purpose other than a definitely related Government procurement operation, the Government thereby incurs no responsibility nor any obligation whatsoever, and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data, is not to be regarded by implication or otherwise, as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.

This report is made available for study with the understanding that proprietary interests in and relating thereto will not be impaired. In case of apparent conflict or any other questions between the Government's rights and those of others, notify the Judge Advocate, Air Force Systems Command, Andrews Air Force Base, Washington, DC 20331.

DO NOT RETURN THIS COPY. RETAIN OR DESTROY.

AFWL-TR-70-170	
WSTI	WHITE SECTION <input type="checkbox"/>
SGC	CLIFF SECTION <input checked="" type="checkbox"/>
U.S. AIR FORCE	<input type="checkbox"/>
DISTRIBUTION	
.....	
BY	
DISTRIBUTION/AVAILABILITY CODES	
DIST.	AVAIL. and/or SPECIAL
3	

UNCLASSIFIED
Security Classification

14. KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
Civil engineering Aircraft shelters Protective construction Structural analysis Doubly corrugated steel arch						

ABSTRACT

The objective of this research was to determine the response of a semicircular orthotropic steel shell aircraft shelter when subjected to symmetric and unsymmetric static load conditions. A numerical technique is presented which is capable of treating the problems of nonlinear material properties, nonlinear geometry, flexure and axial compression, and the orthotropic nature of the structure. Basically, a mathematical model is developed which exhibits the same characteristics (moment-rotation, load-deformation, and ultimate strength) as a finite portion of the actual structure. This information is then used as input to a digital computer program for proper assembly of the stiffness coefficients and subsequent solution. The method of analysis is based on a differential approach to the basic displacement method, and a fourth-order Runge-Kutta integration technique is employed to integrate the differential equations. To verify the analysis, 22 tests were conducted on a full-scale structure which compared favorably to the numerical analysis.

(Distribution Limitation Statement No. 3)

AFWL-TR-70-170

ANALYSIS AND FULL-SCALE TESTING OF AN AIRCRAFT SHELTER

Jimmy H. Smith

The Eric H. Wang Civil Engineering Research Facility
University of New Mexico

TECHNICAL REPORT NO. AFWL-TR-70-170


Each transmittal of this document outside the agencies of the U. S. Government must have prior approval of AFWL (DEZ), Kirtland AFB, NM 87117. Distribution is limited because of the technology discussed in the report.

FOREWORD


This report was prepared by the Eric H. Wang Civil Engineering Research Facility, University of New Mexico, Albuquerque, New Mexico, under Contract F29601-68-C-0000. The research was performed under Program Element 63723F, Projects 5713 and 683M.

Inclusive dates of research were July 1968 through October 1970. The report was submitted 1 April 1971 by the Air Force Weapons Laboratory Project Officer, Captain Jacob C. Armstrong (DEZ). The former project officer was Captain Marcus Moses.

This report has been reviewed and is approved.


JACOB C. ARMSTRONG
Captain, USAF
Project Officer


CLARENCE E. TESKE
Lt Colonel, USAF
Chief, Aerospace Facilities Branch


JEAN M. MARCHAND
Lt Colonel, USAF
Acting Chief, Civil Engineering
Research Division

CONTENTS

<u>Section</u>		<u>Page</u>
I	INTRODUCTION	1
	1. Objectives	1
	2. Description of Structure	1
	3. Previous Work	1
	4. Approach	2
II	FORMULATION OF CONCEPTS	4
	1. General Approach to Full-Scale Structure	4
	2. Matrix Formulation	4
	3. Differential Approach	7
	4. Nonlinear Model	8
	5. Shell Model	13
III	DETERMINATION OF MODEL CHARACTERISTICS	16
	1. Objective	16
	2. Moment-Rotation Tests	16
	3. Force-Deformation Tests	19
	4. Model Characteristics	25
IV	FULL-SCALE TESTS AND ANALYSIS	33
	1. Construction	33
	2. Loading and Instrumentation Systems	33
	3. Types of Tests	34
	4. Numerical Analysis and Comparisons to Experimental Results	42
V	CONCLUSIONS	54
	Appendixes:	
	I Computer Programs	55
	II Input Instructions for Computer Programs	87
	III Sample Input Data for SANOS	90
	IV Sample Output Data for SANOS	99
	References	159

ILLUSTRATIONS

<u>Figure</u>		<u>Page</u>
1	Compatibility Matrix Development	6
2	Richard Equation	9
3	Modeling of Structure	14
4	Model and Numbering System	15
5	Moment-Rotation Test Apparatus	17
6	Hydraulic Ram Loader	17
7	Rotation Measurement Instrumentation	18
8	Moment-Rotation Curves	20
9	Typical Buckling Failure	21
10	Force-Deformation Test Apparatus	25
11	Support Conditions	23
12	Lateral Displacement Measurement Instrumentation	25
13	Force-Deformation Curves	26
14	Repetitive Loading Curves	27
15	Typical Failure Modes (Axial)	28
16	Models	29
17	Section of Structure	31
18	Construction of Loading Floor	35
19	Shelter for First Test Series	37
20	Loading System	38
21	Load-Producing and Load-Measurement Systems	39
22	Deflection-Measurement System	39
23	Deflection-Measurement Detail	40
24	Applied Loads	40

ILLUSTRATIONS (Concl'd)

<u>Figure</u>		<u>Page</u>
25	Analytical and Experimental Deflection Curves	44
26	Crown Displacements (Linear Analysis)	49
27	Comparative Stresses on Inside and Outside Fibers	50
	Grid System Layout Sheets	161-163

TABLES

<u>Table</u>		<u>Page</u>
I	Full-Scale Tests	41
II	Centerline Deflection Versus Total Load Comparisons	43

ABBREVIATIONS AND SYMBOLS

$[A]$	equilibrium matrix
A^*	equivalent shell area used to compute t_{eac}
A_r	cross-sectional area of the element
$[B]$	compatibility matrix
E	modulus of elasticity
I	moment of inertia
$[k]$	structure oriented stiffness matrix
K^*	derivative of K_i with respect to P
K_i	force-displacement function of structure at point i
L	length of element
M	applied moment
M_i	moment at i end of element
M_j	moment at j end of element
M_p	ultimate moment
P	parameter of applied loads
R	either stiffness coefficient or radius
b	width of panel
$\{d\}$	vector of nodal deformations
d_j	generalized displacement at point i in j direction
\dot{d}_j	derivative of d_j with respect to P
$\{f\}$	vector of externally applied forces
f_0	ultimate axial force for each element
$[k]$	element oriented stiffness matrix
\bar{k}	differential element stiffness matrix
n	curve-fitting parameter
$\{p\}$	vector of internal forces

ABBREVIATIONS AND SYMBOLS (Concl'd)

t_M	equivalent thickness (strong axis)
t_W	equivalent thickness (weak axis)
t_{eac}	equivalent shell thickness for axial stress in circumferential direction
t_{efc}	equivalent shell thickness for flexure in circumferential direction
$\{v\}$	vector of internal deformations
$\lambda_i P$	generalized applied load at point i
θ	rotation
θ_i	rotation at i end of element
θ_j	rotation at j end of element

This page intentionally left blank.

SECTION I

INTRODUCTION

1. OBJECTIVES

The objectives of this investigation are (1) to develop a technique for analyzing doubly corrugated steel shells used as protective shelters for aircraft, and (2) to verify the analysis by full-scale testing of such a structure.

2. DESCRIPTION OF STRUCTURE

Although the analysis developed and presented in this report is applicable to general shell structures exhibiting nonlinear response when subjected to arbitrary static loading, the particular structure studied here was a semicircular steel arch shell constructed of doubly corrugated arch panels bolted together to form a completely self-supporting structure. These panels were fabricated of 14-gage sheet steel that was first deformed into somewhat of a U-shape 14 in. deep. Then, to obtain the proper curvature, small corrugations were rolled into the panels on the bottom and sides of the U-shape. Consequently, the assembled structure had deep corrugations circumferentially and small corrugations longitudinally. The structure analyzed and tested in this study was 74 ft long and had an inside radius of 24 ft. This structure was manufactured by Wonder Trussless Building, Inc. of Chicago, Illinois.

3. PREVIOUS WORK

Since the structure being studied was one to which no closed form mathematical solution was applicable, the few previous attempts of analysis (refs. 1,2) have necessarily been restricted to treating the problem as being a linear, elastic, isotropic arch. To the author's knowledge, the change in structural response due to the small corrugations has never been studied.

Similar structures have been evaluated in the past. The U.S. Naval Civil Engineering Laboratory (NCEL) has published two technical reports on the evaluation of doubly corrugated metal buildings (refs. 3,4). In both of these reports, the characteristics determined were shipping weight and cube, weight of metal required, structural strength, ruggedness, erection and reerection time, first costs, and maintenance costs.

Although recently constructed aircraft shelters have a concrete cover, originally they were designed with an earth cover. A rather comprehensive structural test program (ref. 5) was conducted by the Civil Engineering Division of the Air Force Weapons Laboratory (AFWL). The objectives of that study were (1) to establish design criteria and standards for a family of protective shelters, and (2) to evaluate currently available structures for their potential use as aircraft protective shelters. The results indicated that a 48-ft-diameter 10-gage structure with a 14-in.-deep corrugation was capable of sustaining a 10-ft static load of earth cover.

4. APPROACH

a. Numerical Analysis

A numerical technique capable of treating the problems of nonlinear material properties, nonlinear geometry, and orthotropic response to arbitrary loading was developed. To accomplish this, a mathematical model which exhibited the same characteristics (moment-rotation, force-deformation, and ultimate strength) as a finite portion of the actual structure was developed. The entire structure was then analyzed by appropriate assembly of hundreds of these models within a computer program (appendix I) which was developed as part of this investigation. Basically the numerical approach employed was as follows:

- (1) A differential approach to the basic displacement method was employed.
- (2) A three-parameter moment-rotation (and force-deformation) equation was used to represent the material nonlinearity.
- (3) A beam model was used which, when coupled to five other similar beam models, represented the behavior of a portion of the shell both in the elastic and plastic ranges.
- (4) A fourth-order Runge-Kutta integration scheme was employed to integrate the system of differential equations.
- (5) The compatibility matrix was adjusted during the incremental loading in order to account for geometric nonlinearity.

Every attempt was made to retain the physical characteristics of the real structure while developing a method of analysis which had a tractable solution. The end result was a technique which predicts the behavior of the

structure under any static loading condition. This approach was similar to that presented in reference 6.

b. Experimental Program

The experimental phase of this investigation consisted of two parts.

- (1) Laboratory tests were conducted to determine the moment-rotation, force-deformation relationships, and the failure modes of finite portions of the structure. This information was then used as input to the computer program previously mentioned.
- (2) Full-scale tests were conducted on 74 linear feet of the structure using known loads in order to verify the numerical analysis.

As a result of this experimental investigation, a technique which can be used to predict the elastic moment-rotation response of the individual panels was developed. The significance of this is best realized when a requirement for the analysis of a deeper corrugated section arises. By testing circumferential strips of the panels in uniaxial tension, the variation of the modulus of elasticity within the cross section of the panels can be determined. This information can be used to develop a transformed section similar to the approach used in the analysis of reinforced concrete members.

SECTION II

FORMULATION OF CONCEPTS

1. GENERAL APPROACH TO FULL-SCALE STRUCTURE

Although the analysis of the structure being studied appears, at first, to present a relatively simple problem, closer examination reveals several complications that prohibit the use of existing shell-analysis techniques. The structure exhibits pronounced orthotropy, nonlinear response to applied loads, and can be loaded to such an extent as to produce geometric nonlinearity. Since the spectrum of loads of interest encompasses virtually all possible magnitudes, the following conditions must be studied:

- (a) elastic analysis (loads of low intensity),
- (b) nonlinear analysis (loads of higher intensity), and
- (c) ultimate strength analysis (loads that cause collapse).

A procedure has been developed which treats all the above conditions simultaneously. So that one may better understand the approach used in the numerical analysis, development of the matrix formulation is presented in detail. The differential approach used to consider material nonlinearity and the incremental approach used to handle geometric nonlinearity are presented. The mathematical models for the nonlinear beam element, the orthotropic shell element, and the full-scale structure are also presented.

2. MATRIX FORMULATION

Indeterminate structural systems which behave elastically can be analyzed by either the "force" or "displacement" method. Nonlinear systems can also be solved by either method as presented by Richard and Goldberg (ref. 7) and Goldberg and Richard (ref. 8). The displacement method prevails, however, because of the ease of generating the required equations on the digital computer; consequently, this method is applied to the approach taken in this report. Applying the displacement method to nonlinear systems, using a differential point of view, results in a set of simultaneous nonlinear ordinary differential equations which is solved by numerical integration.

The matrix formulation of the displacement method, as used in elastic analysis, is based on equilibrium, stress-strain, and compatibility relationships of a deformable body.

Consideration of equilibrium results in the following expression relating the vector of applied forces, $\{f\}$, to the vector of internal forces, $\{p\}$.

$$\{f\} = [A]\{p\} \quad (1)$$

where $[A]$ is known as the equilibrium matrix.

Employing stress-strain (e.g., moment-rotation or force-deformation) concepts, the internal forces, $\{p\}$, are expressed in terms of the internal deformations, $\{v\}$.

$$\{p\} = [k]\{v\} \quad (2)$$

where $[k]$ is the stress-strain relationship (usually called the element stiffness matrix).

Enforcing continuity results in the following expression relating external deformations, $\{d\}$, to the internal deformations, $\{v\}$.

$$\{v\} = [B]\{d\} \quad (3)$$

where $[B]$ is the compatibility matrix presented in figure 1.

Applying a set of virtual displacements to a structure which is subjected to the action of real loads and introducing the theorem of virtual work gives

$$\{f\}^t\{d\} = \{p\}^t\{v\} \quad (4)$$

Substitution of eqs. (1) and (3) into (4) results in

$$\{p\}^t[A]^t\{d\} = \{p\}^t[B]\{d\} \quad (5)$$

Therefore, the compatibility matrix is the transpose of the equilibrium matrix.

$$[B] = [A]^t \quad (6)$$

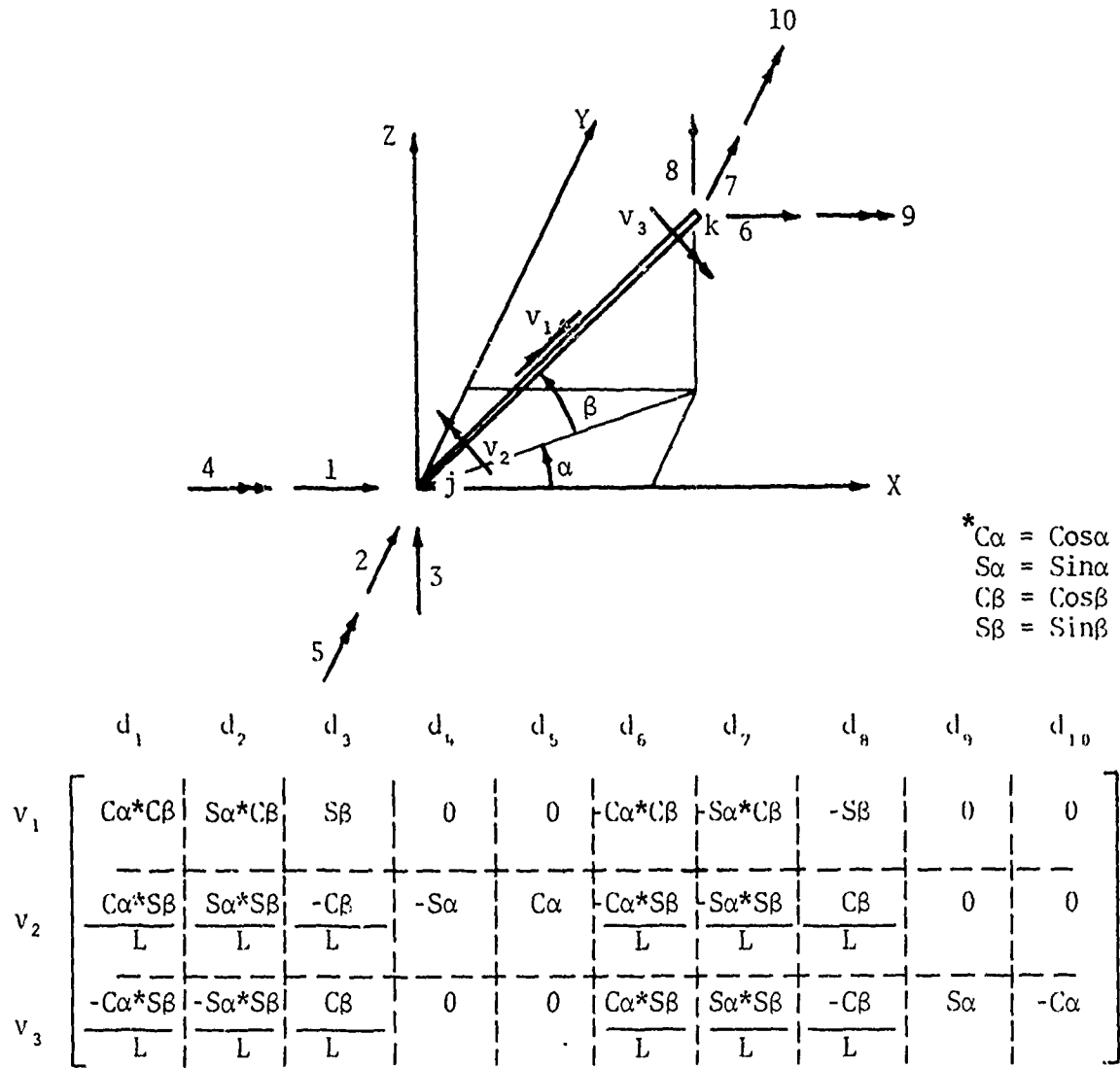


Figure 1. Compatibility Matrix Development

It can now be shown that

$$\{f\} = [B]^t [k] [B] \{d\} \quad (7)$$

or

$$\{f\} = [K] \{d\} \quad (8)$$

and

$$\{p\} = [k][B]\{d\} \quad (9)$$

where $[K]$ is known as the structure oriented stiffness matrix ($[K] = [B]^T[k][B]$).

Equation (8) represents a set of simultaneous algebraic equations, the solution of which yields the linearly elastic response of the structure for any statically applied loading.

3. DIFFERENTIAL APPROACH

In structural systems which exhibit nonlinear material behavior, the displacements are not linear functions of the applied loading and, consequently, a differential approach must be taken. In order to formulate the fundamental equations of a nonlinear structure, consider first the set of equations derived for linear structures and introducing proportional loading,

$$\lambda_i P = K_i(d_j) \quad (10)$$

where P is the parameter of applied loads, $\lambda_i P$ represents the generalized applied load at point i , K_i denotes the force-displacement function of the structure at point i , and d_j is the generalized displacement at point i in the j direction. The differential form of eq. (10) is

$$\frac{d}{dP}(\lambda_i P) = \frac{d}{dP}(K_i(d_j)) \quad (11)$$

or

$$\lambda_i = F_i(d_j, \dot{d}_j) \quad (12)$$

where

$$F_i(d_j, \dot{d}_j) = \frac{dK_i(d_j)}{dP} \quad (13)$$

and

$$\dot{d}_j = \frac{d}{dP}(d_j) \quad (14)$$

Integration of eq. (14) results in a complete displacement pattern for the nonlinear structure for any given applied loading and initial conditions (ref. 8). This integration is accomplished numerically using a fourth order Runge-Kutta technique.

By introducing a shorthand notation for the first term on the right side of eq. (13),

$$\frac{dK_i}{dP^i} = K^* \quad (15)$$

K^* is the generalized differential stiffness matrix and is determined by

$$K^* = B^t \bar{k} B \quad (16)$$

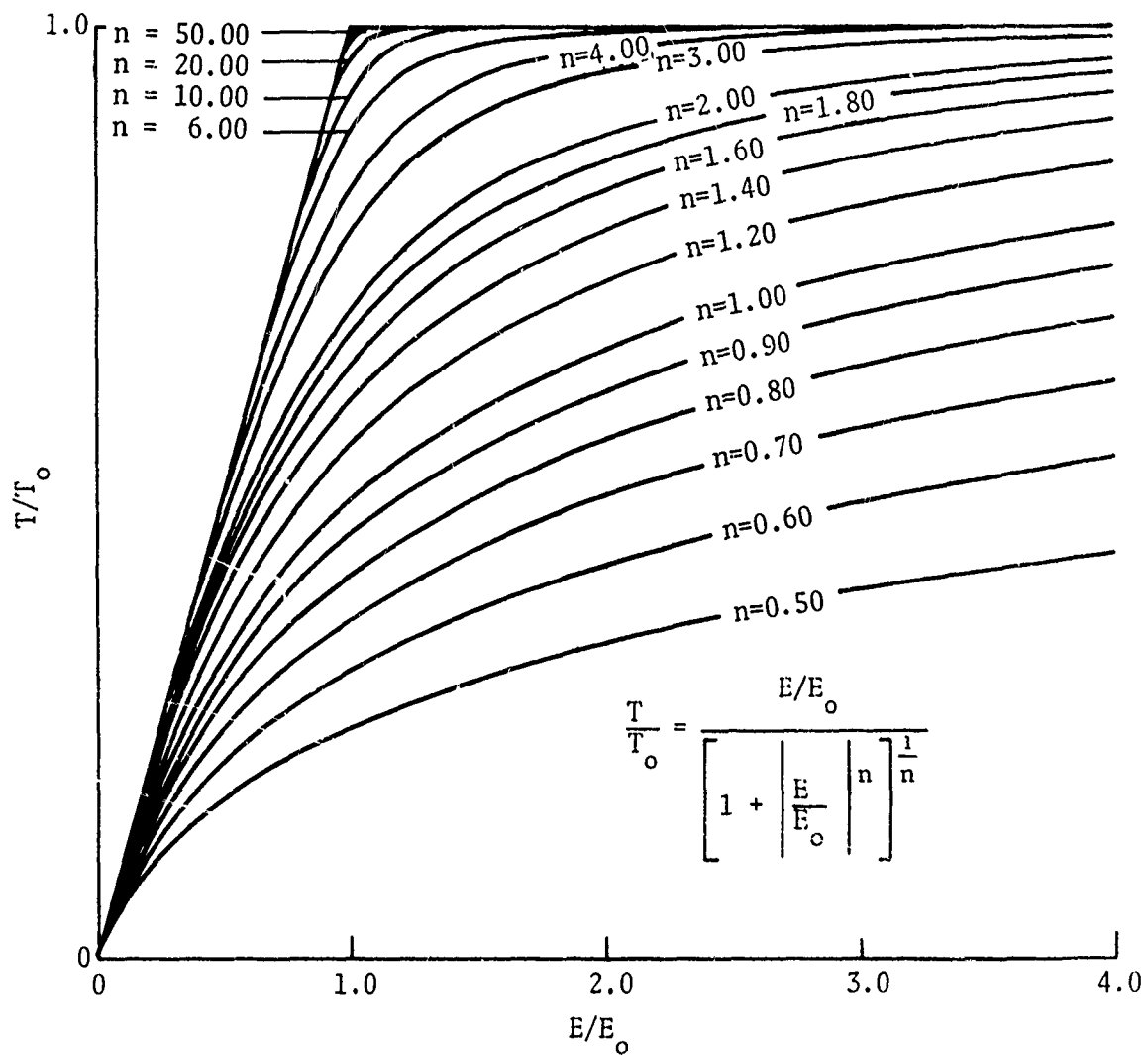
where \bar{k} is a square matrix relating differential element displacements to the differential element forces.

4. NONLINEAR MODEL

In order to develop a mathematical beam model, an expression for nonlinear moment-rotation and force-deformation is required. The Richard stress-strain formula (ref. 7) was chosen because of its smooth transition to fully plastic behavior and its asymptotic nature. The following equation is one form of the expression.

$$M = \frac{R\theta}{\left[1 + \left| \frac{R\theta}{M_p} \right|^n \right]^{1/n}} \quad (17)$$

where R , θ , M , M_p , and n denote the stiffness coefficient, rotation, moment, ultimate moment, and the curve-fitting parameter, respectively. A nondimensionalized form of this equation is shown in figure 2.



T = moment, force, stress

T_o = ultimate (or plastic) value of T

E = rotation, deformation, strain

E_o = terminal value of E corresponding to T_o

n = curve-fitting parameter

Figure 2. Richard Equation

Equation (17) can be solved for $R\theta$, thus

$$R\theta = \frac{M}{\left[1 - \left| \frac{M}{M_p} \right|^n \right]^{1/n}} \quad (18)$$

Differentiation of eq. (18) with respect to the load parameter, P , yields

$$\frac{d}{dP}(R\theta) = \frac{\frac{dM}{dP}}{\left[1 - \left| \frac{M}{M_p} \right|^n \right]^{(n+1)/n}} \quad (19)$$

Equation (8) can be rewritten as

$$\{d\} = [K]^{-1}\{f\} \quad (20)$$

or in another form as

$$\{\theta\} = [K]^{-1}\{M\} \quad (21)$$

and in incremental differential form as

$$\frac{d}{dP}(\{\theta\}) = [K^*]^{-1} \frac{d\{M\}}{dP} \quad (22)$$

where $[K]^{-1}$ is the flexibility matrix corresponding to the stiffness matrix, $[K]$, and $[K^*]^{-1}$ is the corresponding differential relationship which is constant during each load increment (as well as during each numerical integration increment).

By using eqs. (19) and (22), the following expression can be written for a single beam element.

$$\begin{Bmatrix} \frac{d\theta_i}{dP} \\ \frac{d\theta_j}{dP} \end{Bmatrix} = \begin{bmatrix} \frac{L}{3EI} & -\frac{L}{6EI} \\ -\frac{L}{6EI} & \frac{L}{3EI} \end{bmatrix} \begin{Bmatrix} \frac{dM_i}{dP} \\ \frac{dM_j}{dP} \end{Bmatrix} \quad (23)$$

$\left[1 - \left| \frac{M_i}{M_p} \right|^n \right]^{(n+1)/n}$
 $\left[1 - \left| \frac{M_j}{M_p} \right|^n \right]^{(n+1)/n}$

Introducing the notations

$$A_i = \left[1 - \left| \frac{M_i}{M_p} \right|^n \right]^{(n+1)/n}$$

and

$$A_j = \left[1 - \left| \frac{M_j}{M_p} \right|^n \right]^{(n+1)/n}$$

and solving eq. (23) for the differential moments, the following equation is obtained.

$$\begin{Bmatrix} \frac{dM_i}{dP} \\ \frac{dM_j}{dP} \end{Bmatrix} = \frac{6EI}{L} \begin{bmatrix} 2A_i & A_i A_j \\ A_i A_j & 2A_j \end{bmatrix} \begin{Bmatrix} \frac{d\theta_i}{dP} \\ \frac{d\theta_j}{dP} \end{Bmatrix} \quad (24)$$

To illustrate the behavior of the model, consider a large value for the curve-fitting parameter, n (thus making the curve bilinear). If neither end moment has reached its ultimate value ($M_i < M_p$ and $M_j < M_p$), eq. (24) becomes

$$\begin{Bmatrix} \frac{dM_i}{dP} \\ \frac{dM_j}{dP} \end{Bmatrix} = \begin{bmatrix} \frac{4EI}{L} & \frac{2EI}{L} \\ \frac{2EI}{L} & \frac{4EI}{L} \end{bmatrix} \begin{Bmatrix} \frac{d\theta_i}{dP} \\ \frac{d\theta_j}{dP} \end{Bmatrix} \quad (25)$$

which indicates linear action for the beam. If, however, the moment at the j end of the beam element has reached its ultimate value ($M_j = M_p$), while the moment at the i end is still elastic ($M_i < M_p$), eq. (24) becomes

$$\begin{Bmatrix} \frac{dM_i}{dP} \\ \frac{dM_j}{dP} \end{Bmatrix} = \begin{bmatrix} \frac{3EI}{L} & 0 \\ 0 & 0 \end{bmatrix} \begin{Bmatrix} \frac{d\theta_i}{dP} \\ \frac{d\theta_j}{dP} \end{Bmatrix} \quad (26)$$

which represents the stiffness coefficients for the beam pinned at the j end. This nonlinear beam model is used in the assembly of the shell model, which consists of six interconnected beams.

In order to incorporate the effect of axial force-deformation in the shell, the element stiffness matrix must be expanded. This expansion is

$$\begin{Bmatrix} \frac{df_1}{dP} \\ \frac{d\Gamma_2}{dP} \\ \frac{df_3}{dP} \end{Bmatrix} = \frac{\frac{6EI}{L}}{4 - A_i A_j} \begin{bmatrix} \frac{Ar(4 - A_i A_j)}{6 \left[1 + \left| \frac{f_1}{f_0} \right|^n \right]^{(n+1)/n}} & 0 & 0 \\ 0 & 2A_i & A_i A_j \\ 0 & A_i A_j & 2A_j \end{bmatrix} \begin{Bmatrix} \frac{dv_1}{dP} \\ \frac{dv_2}{dP} \\ \frac{dv_3}{dP} \end{Bmatrix} \quad (27)$$

where $f_1, v_1, f_2, v_2, f_3, v_3$ denote the axial force and deformation, moment and rotation at the i end, and moment and rotation at the j end, respectively. The term Ar represents the cross-sectional area of the element and f_0 denotes the ultimate axial force for each element.

Figure 3 shows a portion of the actual structure to be analyzed, an equivalent physical model, a shell model, and a beam model. Since the background for the nonlinear beam model has been established, it remains now to show how these beam elements are to be interconnected to form the shell model and to develop expressions for the physical properties of these elements.

Geometric nonlinearity is treated with an incremental loading approach that assumes finite deflections. If large deflections are to be considered in the future, an iterative approach must be used. However, a rough approximation of a collapsed configuration may be obtained by incrementing the load vector.

5. SHELL MODEL

In order to obtain a general method for the analysis of nonlinear shell structures, a model must first be developed which adequately predicts the initial linear response and which may be modified to account for nonlinear action. The framework model, comprised of six interconnected beam elements, appears to fulfill the above requirements. A model first introduced by Hrennikoff (ref. 9), later used by Yettram and Husain (ref. 10), and subsequently extended to the nonlinear analysis of plate structures by Smith (ref. 6) was used as a guide to develop a model for orthotropic shell structures. The model used in this study is shown in figure 4. In order to obtain the properties of the individual beams, laboratory tests were conducted to determine the initial elastic response and the ultimate (plastic) capacity of portions of the actual structure when subjected to bending and axial force. The details of this technique and the laboratory results are presented in section III.

The full-scale structure is modeled by assembling (on the digital computer) many elements; consequently, any load, symmetric or unsymmetric, may then be applied and the results will include the elastic and nonlinear responses.

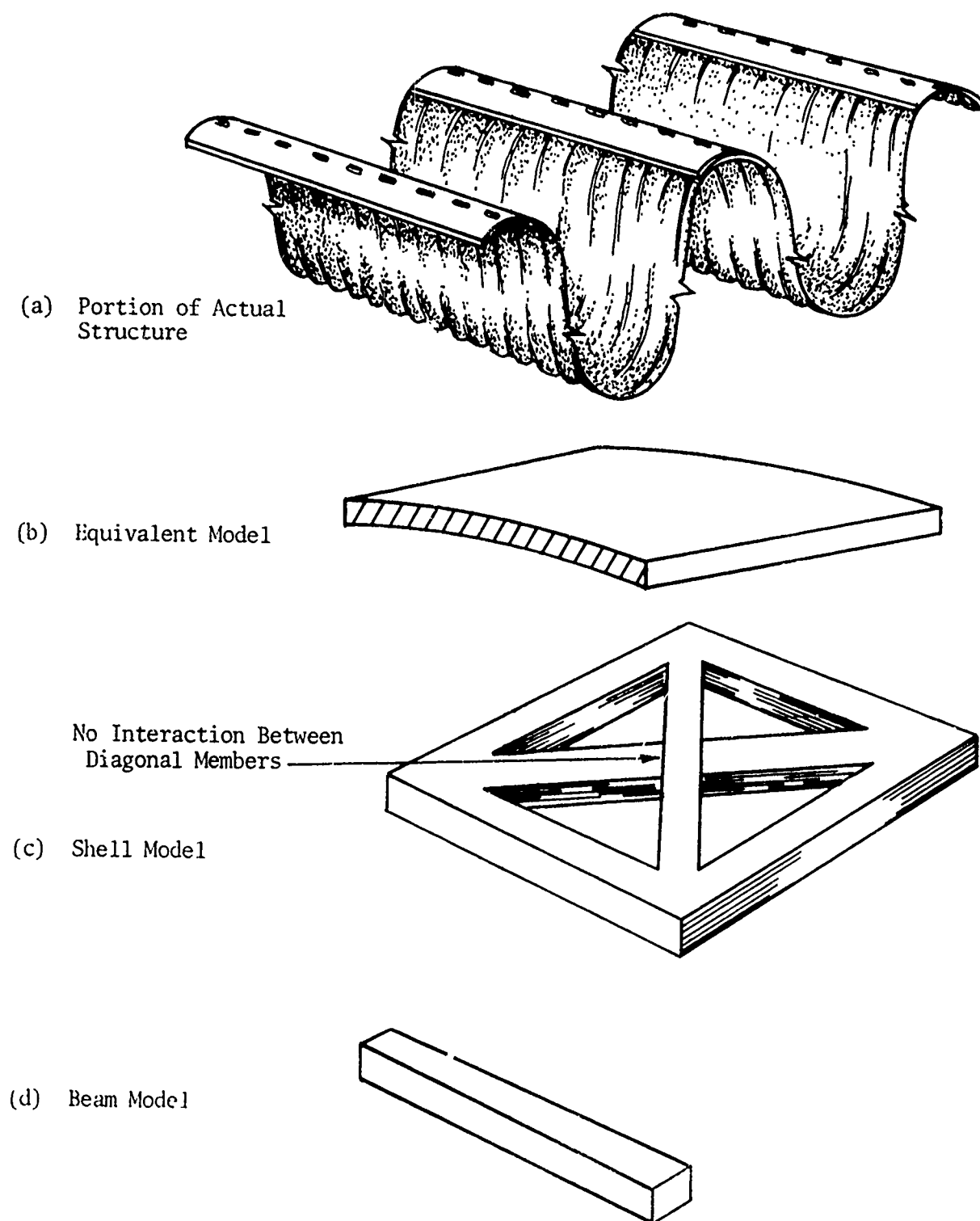


Figure 3. Modeling of Structures

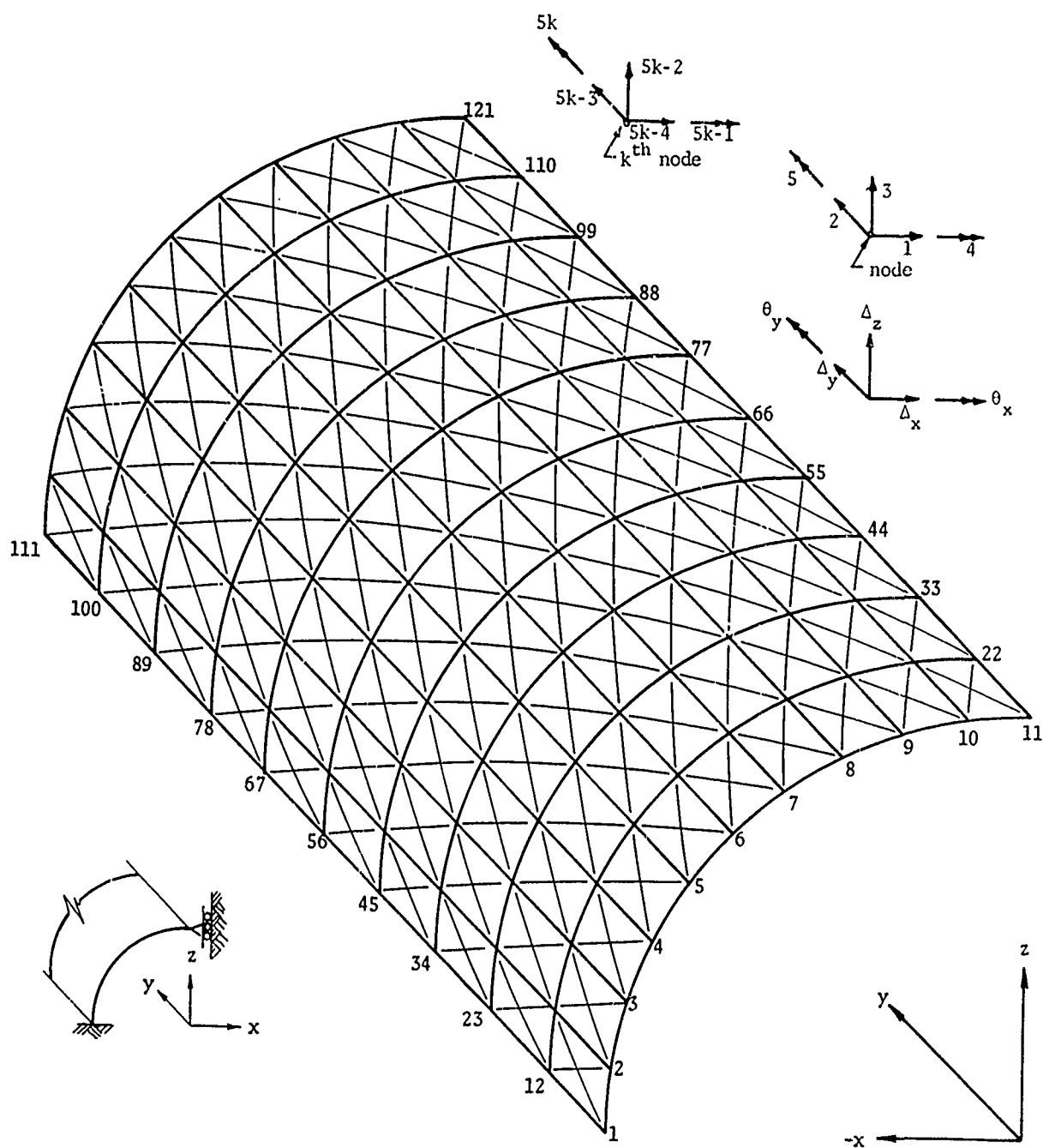


Figure 4. Model and Numbering System

SECTION III

DETERMINATION OF MODEL CHARACTERISTICS

1. OBJECTIVE

Before the concepts previously developed can be used to predict the behavior of the entire structure, information concerning the action of portions of the structure must be obtained. This section is devoted to a presentation of the laboratory tests conducted which are necessary for the determination of the required parameters for moment-rotation and force-deformation relationships.

2. MOMENT-ROTATION TESTS

a. Apparatus

In order to obtain the flexural behavior of a portion of the structure, a 20-ft section of the arch was tested as shown in figure 5. This test setup consisted of center supports located 76 in. apart which were connected to the panel with flanged cartridge ball bearings and a 2-inch-diameter solid-steel shaft. The loads were applied near the ends with double-acting hydraulic rams which made it possible to subject the panel to both positive and negative moments. Figure 6 shows the positive moment setup. It should be noted that the base of the ram was hinged to allow for rotation during loading. In order to subject the panel to negative moment, a 1-inch-diameter eyebolt was extended through the concrete (used for a load-distributing device) and the steel. The hydraulic pressure line was connected to the top of the ram.

Although figure 5 shows the lower end of both supports as fixed, later modifications involved the installation of a shaft with pillow block type ball bearings so the effect of combined bending and axial force could be studied. This effect was negligible on the initial response but did tend to result in a change in the ultimate moment of the section of about 15 percent (stronger with fixed base).

b. Instrumentation

Since the three parameters needed to use eq. (17), shown in figure 2, are initial slope of the moment-rotation curve, the ultimate moment, and the overall shape of the curve, instrumentation was chosen that would

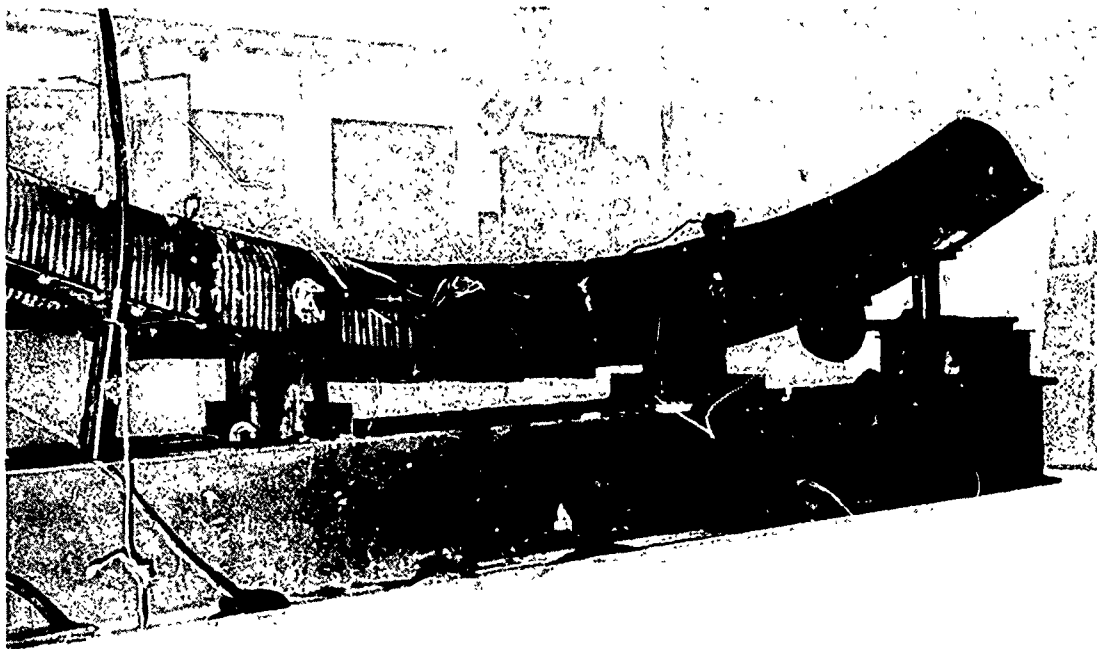


Figure 5. Moment-Rotation Test Apparatus

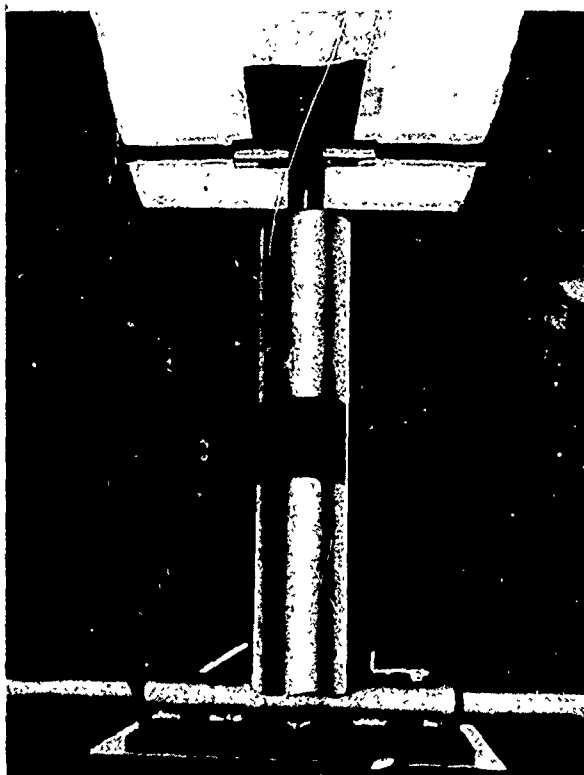


Figure 6. Hydraulic Ram Loader

continuously record the pressure in the rams and the resulting rotation at the supports. This information was recorded on the existing data acquisition system at CERF. It was recorded at 1-7/8 in./sec, played back at 60 in./sec, and plotted on an x-y plotter. Figure 7 shows the method used to obtain the amount of rotation. A 12-inch-diameter aluminum plate was attached to the support shaft; piano wire was placed around the circular plate and attached to a weight which moved vertically under test conditions. This movement was measured with linear potentiometers on both sides of the shaft in order to cancel the effect of vertical movement of the shaft.

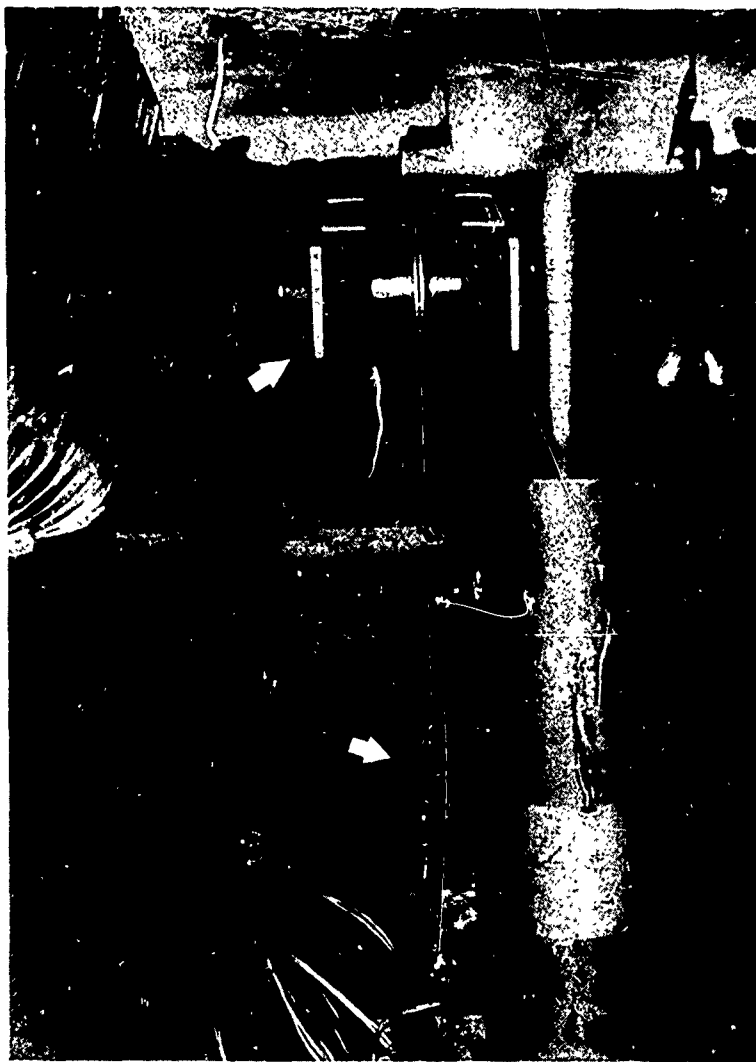


Figure 7. Rotation Measurement Instrumentation

c. Results

Initially, it was believed that there would be significant differences in positive and negative bending. However, inspection of the results (shown plotted in figure 8) revealed the difference in elastic response to be relatively small and, consequently, the effort required to incorporate the difference into the computer program was not considered necessary. The major difference occurred in the ultimate moment.

The initial slope of the moment-rotation curve is

$$\frac{M}{\theta} = 2,000 \text{ ft-kips/radian} \quad (28)$$

and the ultimate moment is

$$M_o = 30 \text{ ft-kips/panel} \quad (29)$$

Although the curve-fitting parameter, n , is approximately 3, values of 2 and 4 would not be unreasonable. Studies were conducted with the computer program to determine the difference in final results for a range of 2 to 4 on the curve-fitting parameter. The final results were only slightly affected for problems where structural yielding was not widespread.

In every test, failure of the panels was of the buckling type. Figure 9 shows typical types of failure.

3. FORCE-DEFORMATION TESTS

a. Apparatus

As in the case of moment-rotation tests, axial force-deformation tests were conducted to determine the initial response, the ultimate axial force, and the general shape of the force-deformation curve for a portion of the structure. The equipment used in this test was a static hydraulic testing machine. The test setup is shown in figure 10. Figure 11 shows an early trial test on a short portion of the structure (which proved unstable); it is presented here because the bottom support in subsequent tests was the same as the top support shown in this figure.

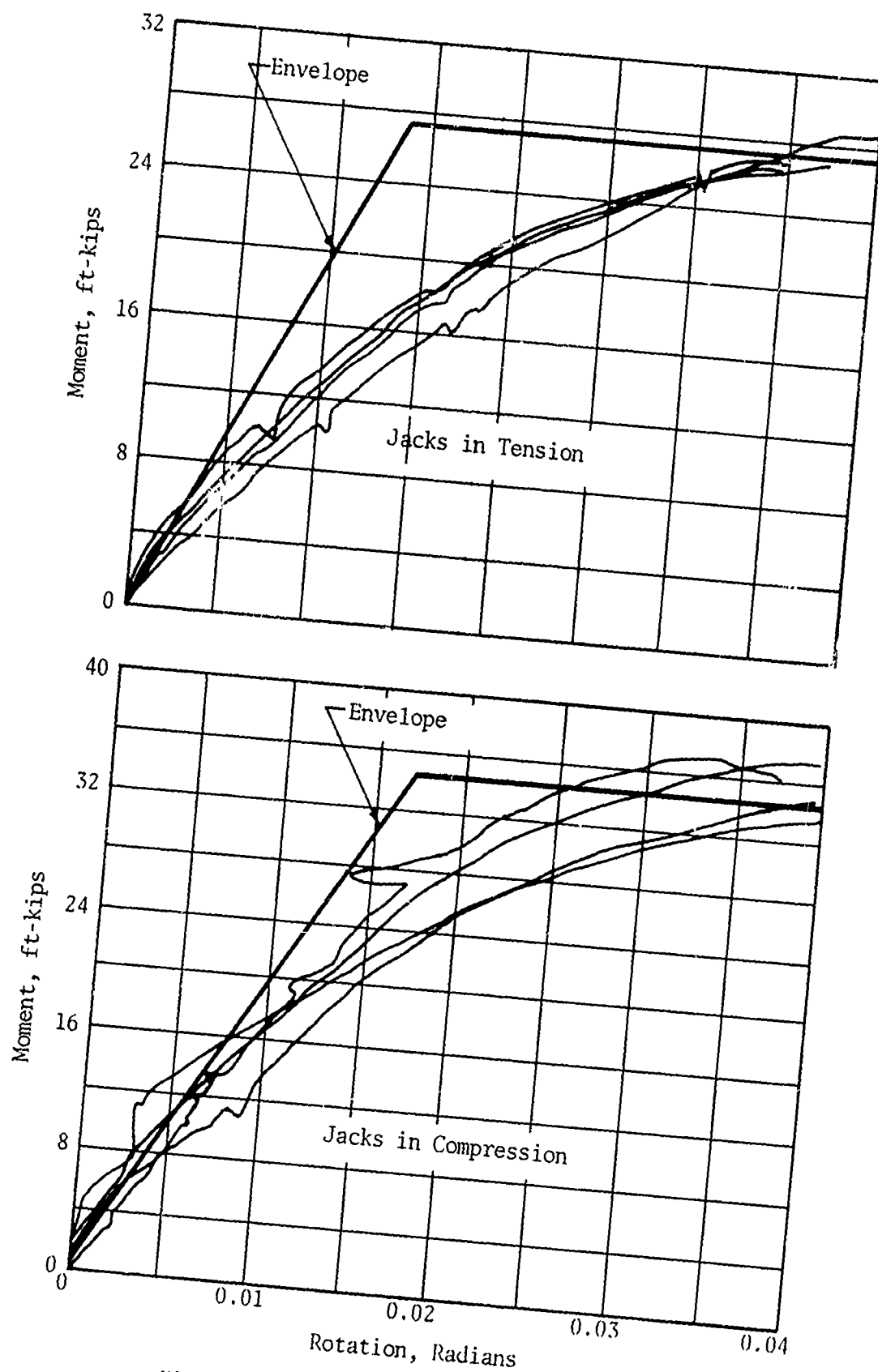


Figure 8. Moment-Rotation Curves

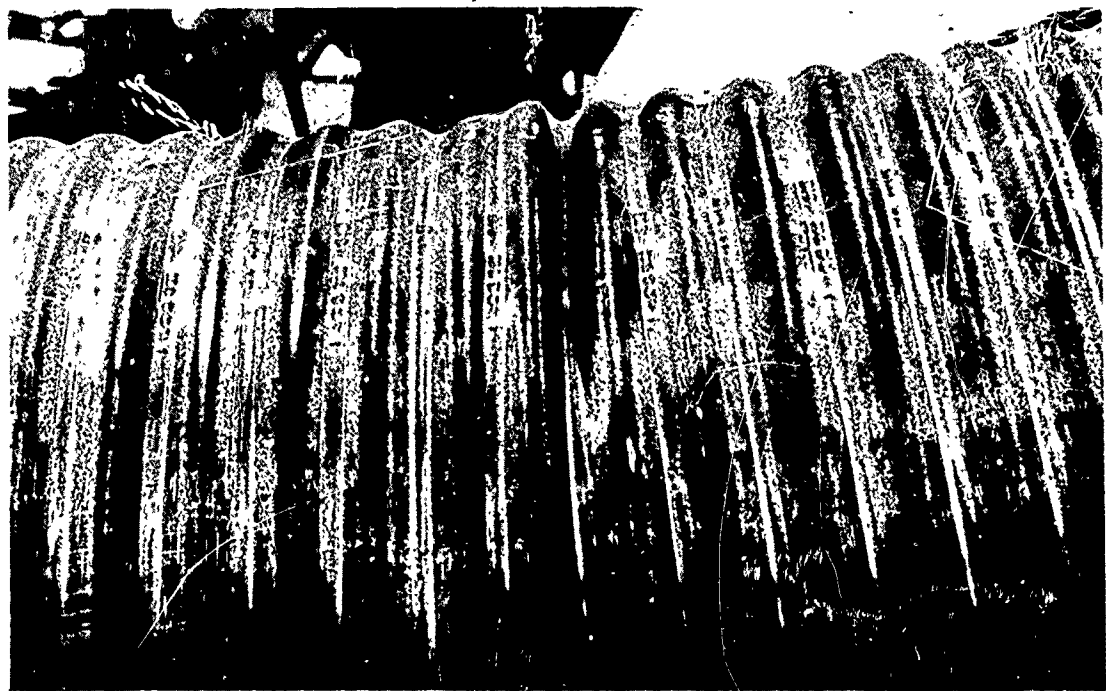
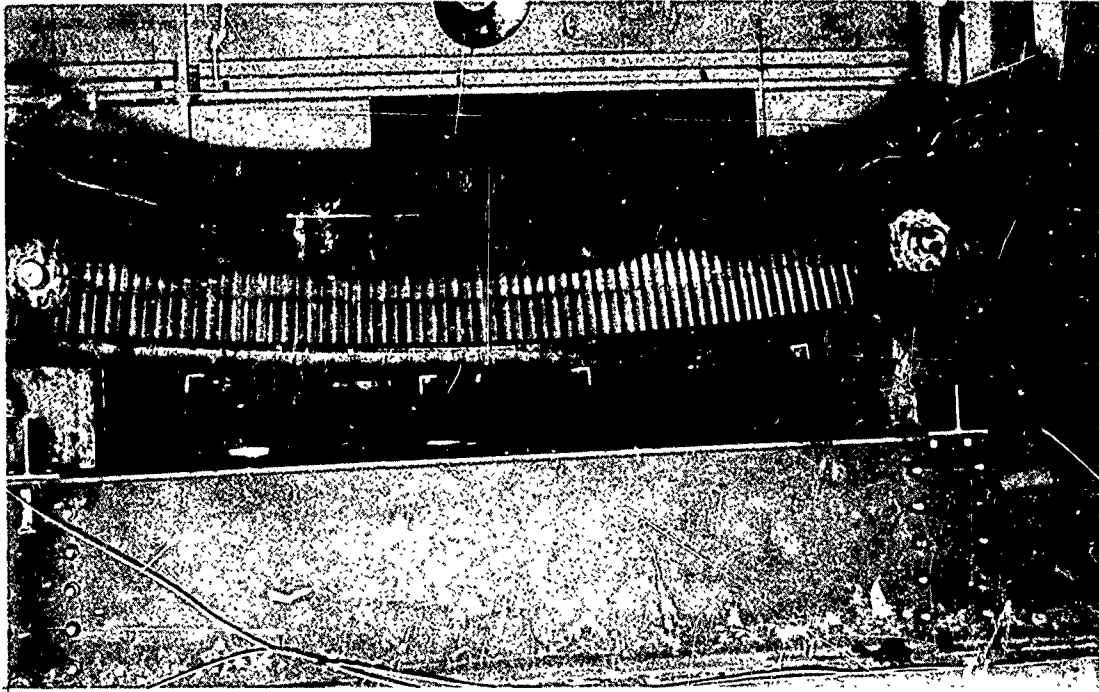


Figure 9. Typical Buckling Failures

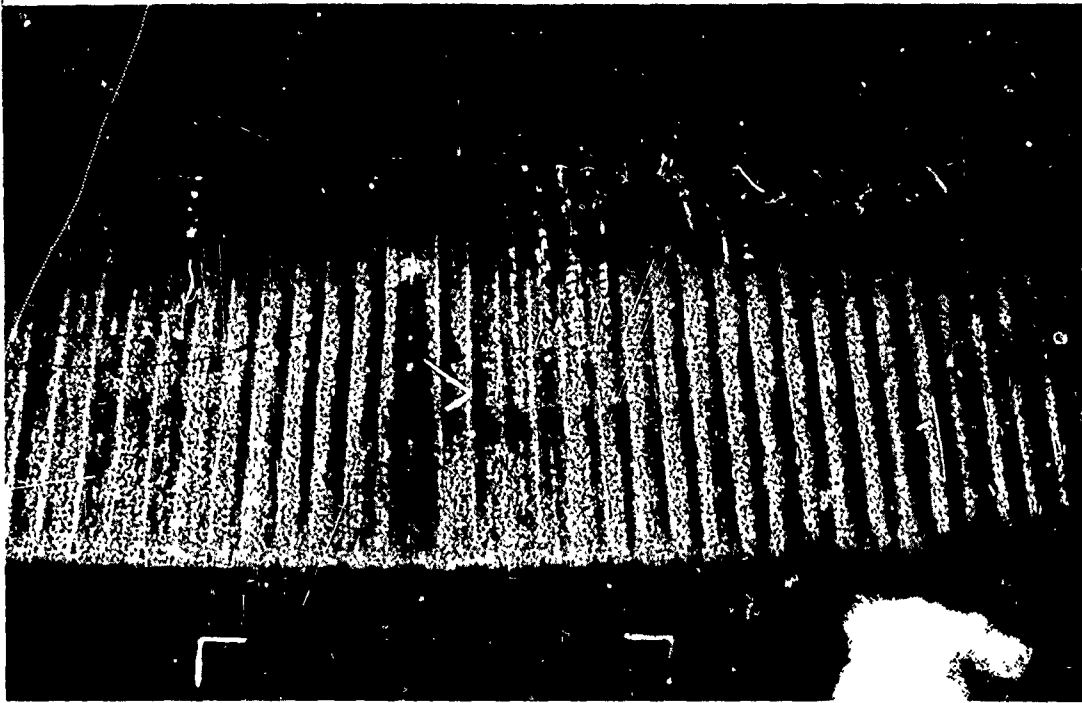


Figure 9---Concluded



Figure 10. Force-Deformation Test Apparatus

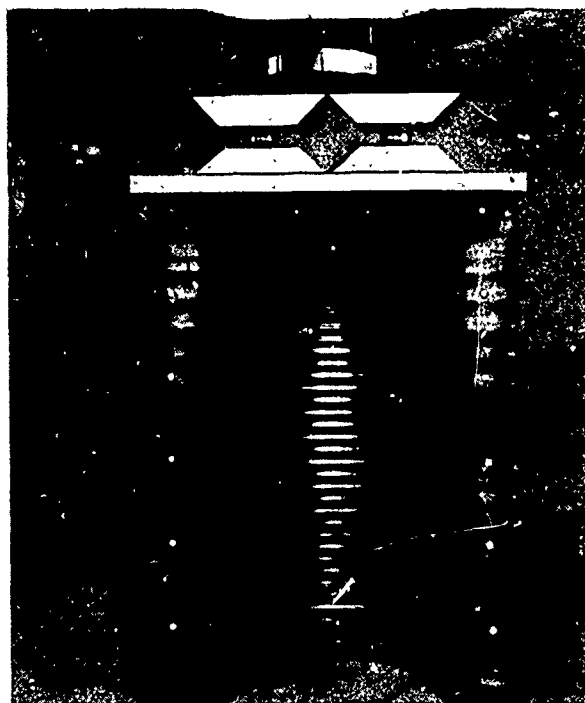


Figure 11. Support Conditions

b. Instrumentation

In order to obtain the complete shape of the force-deformation curve, both the load from the hydraulic loader and the displacement of the loading head were continuously recorded on an x-y plotter. In addition, potentiometers were mounted horizontally to observe lateral displacement (fig. 12). This information was recorded on paper tape readout.

c. Results

Since the panels were initially curved, the axial loads created some flexure because of the eccentricity. This effect was minimized by aligning the end loads with the centroid of the center (lengthwise) of the panel. Virtually all of the sections tested failed by local buckling at or very near the center. The type of buckling was essentially the same as that resulting from the moment-rotation tests. The response of the panels when subjected to axial force is presented in figure 13. Several specimens were loaded and unloaded repeatedly and a typical curve for this test is shown in figure 14. The repeated loading had no effect on either the initial or the final response of the panels.

From figure 13, the average initial slope of the curves for tests A-2, A-3, A-5, and A-6 is

$$\frac{P}{\Delta L} \doteq 1,950 \text{ kips/in.} \quad (30)$$

and the ultimate force is

$$f_o = 40 \text{ kips/panel} = 1.665 \text{ kips/in.} \quad (31)$$

Also, the curves are essentially bilinear and can be reproduced with eq. (17) using a large value of n (say $n = 20$). These values are needed to develop a model with the same characteristics.

In every test, the failure was a buckling type similar to those shown in figure 15.



Figure 12. Lateral Displacement
Measurement Instrumentation

4. MODEL CHARACTERISTICS

In order to generate a system of equations which represents the action of the entire structure when subjected to an arbitrary loading condition, information must be obtained regarding the representative equations for a portion of the structure. Basically, the parameters in the equations shown in matrix form by eq. (27) must be determined.

First, the actual structure is reduced to a cylindrical shell which has a constant thickness circumferentially based on the initial elastic response of portions of the structure. Also, the model will have a constant thickness in the longitudinal direction which differs from the circumferential thickness. It should be noted that the model will have characteristics that represent both compression and flexural modes.

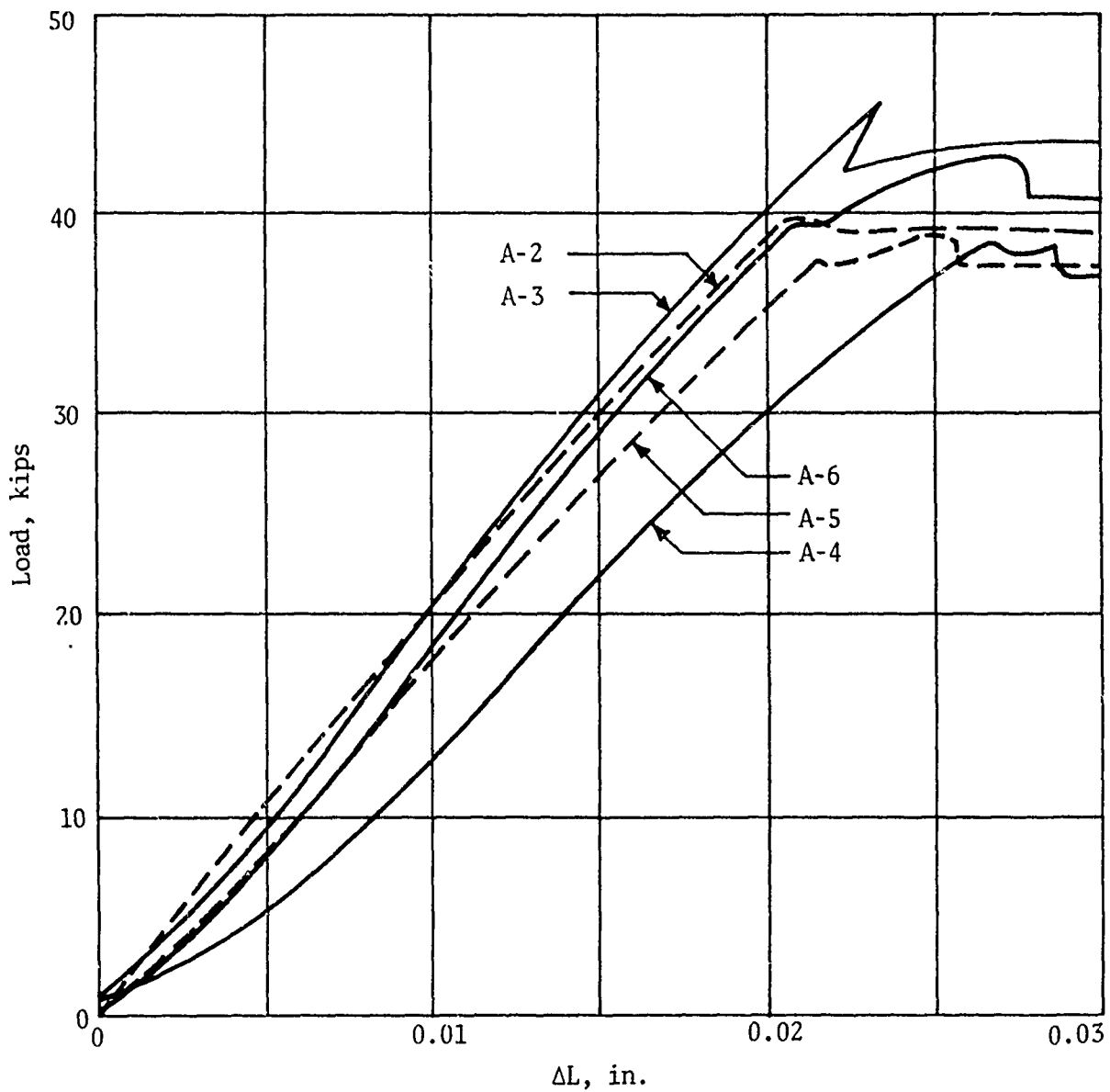


Figure 13. Force-Deformation Curves

Consider the flexural mode in the circumferential direction. If moments are applied along parallel sides of the element (shown in figure 16a), the resulting rotation is $ML/2EI$ if purely cylindrical bending is assumed. Solving in terms of M/θ

$$\frac{M}{\theta} = \frac{2EI}{b} \quad (32)$$

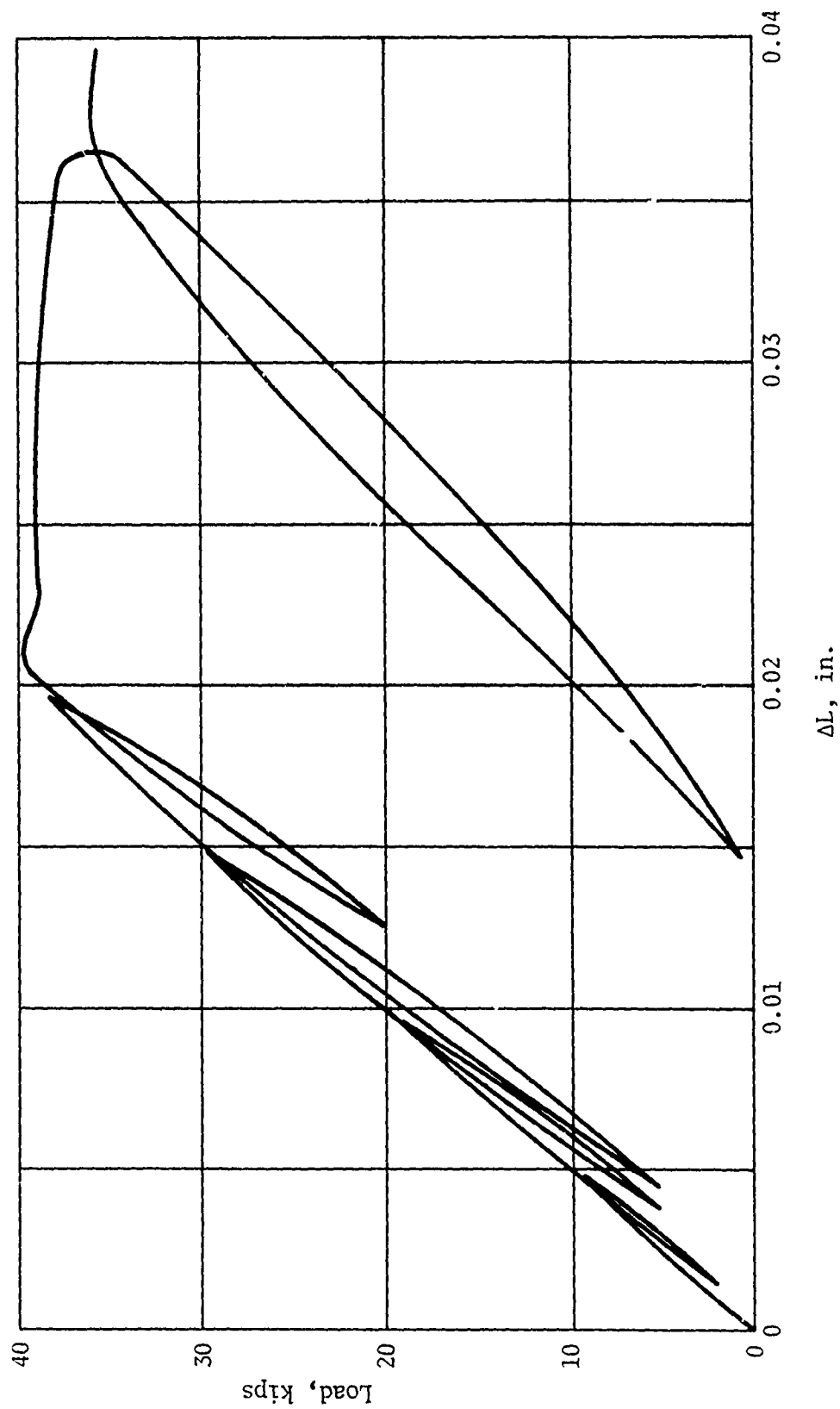


Figure 14. Repetitive Loading Curves

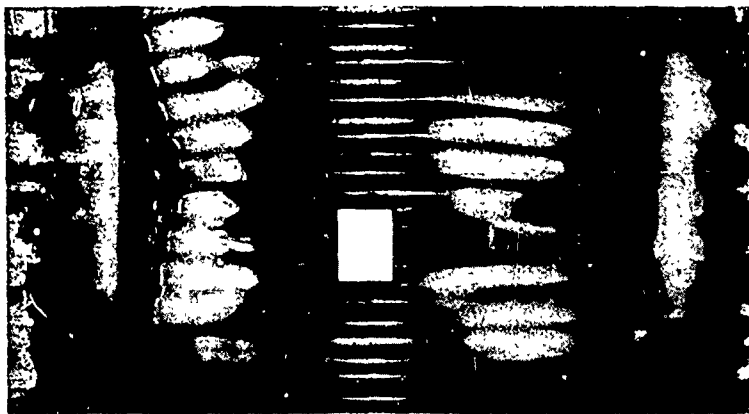
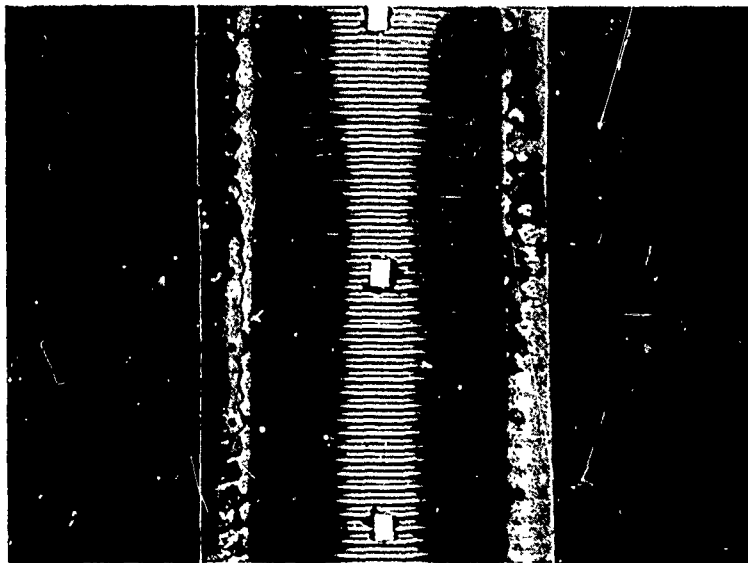


Figure 15. Typical Failure Modes (Axial)

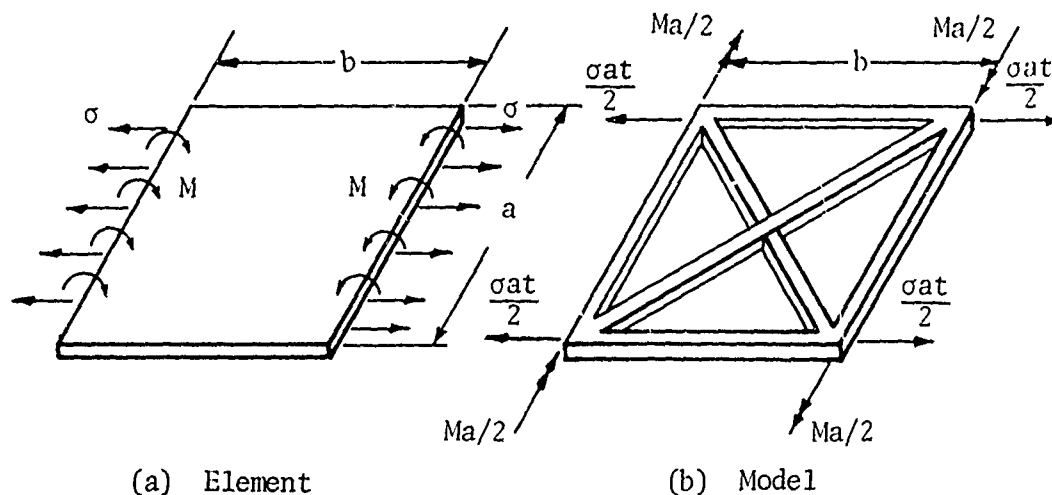


Figure 16. Models

Equating this to the experimental value, eq. (28)

$$\frac{M}{\theta} = \frac{2EI}{b} = \frac{2(30 \times 10^3)I}{76} = 2,000(12) \quad (33)$$

thus

$$I = 30.4 \text{ in.}^4/\text{panel} \quad (34)$$

A very important point must be made here. In all previous analyses, the moment of inertia has been taken as $I = \int_A y^2 dA$ which results in $I = 92.4 \text{ in.}^4/\text{panel}$. This approach assumes a homogeneous cross section which at first may appear valid but if the small corrugations are considered, it becomes obvious that the slopes of the stress strain curves vary within the cross section. It should be noted that the stress and strain are average values and not the true stress and strain at a point. The author has developed a procedure to predict the elastic response of the section by removing (cutting) strips from the section and obtaining a modular ratio which is then used to develop a transformed section. The results of this approach are essentially the same as those obtained from the moment-rotation tests.

Consider a rectangular section

$$I = \frac{1}{12} at^3_{efc} \quad (35)$$

where t_{efc} denotes the equivalent thickness for flexure in the circumferential direction. For our case where $a = 24$ in. (single panel test)

$$t_{efc} = 2.48 \text{ in.} \quad (36)$$

It should be noted that other approaches are possible. For example, an effective EI could be determined. However, since E appears in both the axial compression and the flexural modes, it was decided that the approach used here is a more logical one.

Since the structure is orthotropic, an investigation into its flexural capacity in the longitudinal direction is required. The strength (both in compression and flexural modes) in this direction is very small compared to that in the circumferential direction. In fact, tests have shown that the strength in this direction could be neglected if the grid size could be chosen small enough. However, because of the core storage on the digital computer, the grid size used was such that the flexural capacity in the longitudinal direction was required.

Consider a portion of the structure as shown in figure 17. The location of the centroid is determined as

$$\bar{y} = \frac{\int_A y dA}{\int_A dA} = 2 \frac{\int_0^\phi R \cos \theta t R d\theta}{2R\phi t} = \frac{R}{\phi} \sin \phi \quad (37)$$

The moment of inertia about the x-axis is

$$I_x = \int_A y^2 dA = 2 \int_0^\phi (R \cos \theta)^2 t R d\theta = R^3 t \left(\phi + \frac{1}{2} \sin 2\phi \right) \quad (38)$$

Then the moment of inertia about the centroidal axis is

$$I_{CG} = I_x - A\bar{y}^2 = R^3 t \left(\phi + \frac{1}{2} \sin 2\phi - \frac{2}{\phi} \sin^2 \phi \right) \quad (39)$$

This information is used in appendix I to determine the properties of longitudinal members.

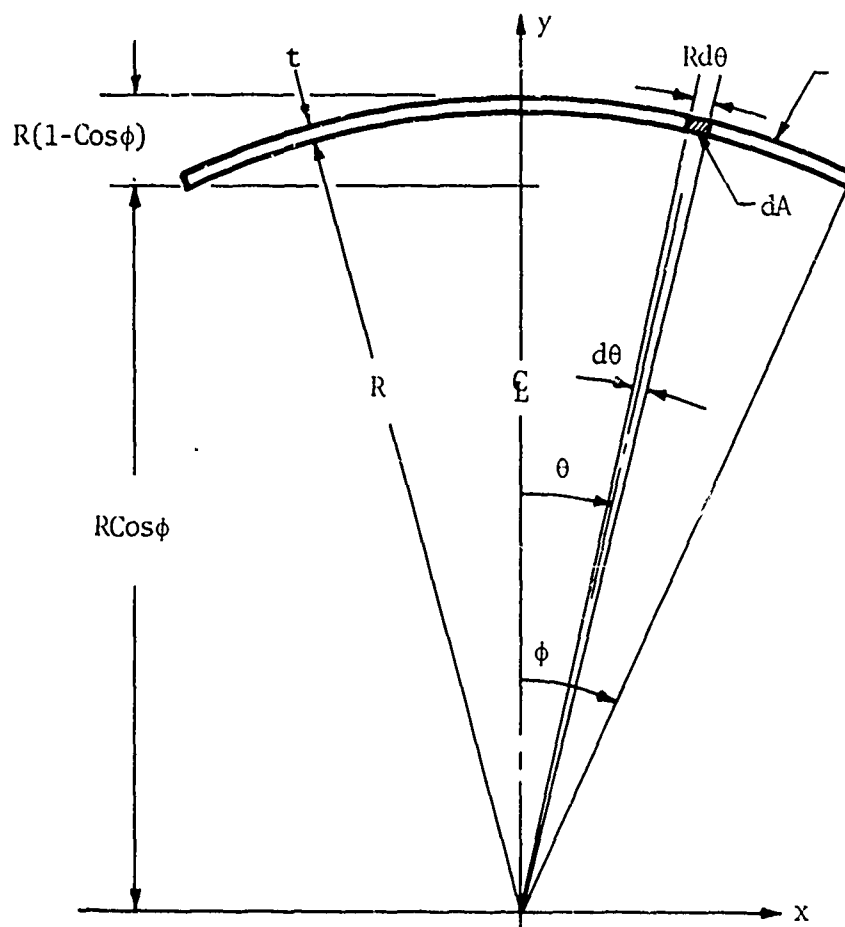


Figure 17. Section of Structure

The force-deformation relationships, as determined from laboratory tests and shown in figure 13, are used to develop the required model parameters. To obtain an equivalent shell thickness, consider

$$E = \frac{\sigma}{\epsilon} = \frac{P/A}{\Delta L/L} = \left(\frac{P}{\Delta L} \right) \left(\frac{L}{A^*} \right) \quad (40)$$

$$A^* = \left(\frac{P}{\Delta L} \right) \left(\frac{L}{E} \right) = \frac{(1,950)(76)}{30,000} = 0.493 \text{ in}^2/\text{panel} \quad (41)$$

Then the equivalent thickness for axial stress in the circumferential direction is

$$t_{eac} = 0.493/24 = 0.0205 \text{ in.}^2/\text{in.} \quad (42)$$

The equivalent thickness in the longitudinal direction was taken as the true material thickness.

Considering the ultimate force, eq. (31), and the equivalent area, eq. (41), the ultimate axial stress, σ_o , is obtained.

$$\sigma_o = \frac{f_o}{A^*} = \frac{40}{0.493} = 81.3 \text{ ksi} \quad (43)$$

The diagonal members shown in figure 16b are not actually required for stability in low ranges of loading. However, as the structure starts to yield, the equations become unstable and their solution meaningless. These members are supplied to stabilize the system and permit a complete nonlinear solution.

SECTION IV

FULL-SCALE TESTS AND ANALYSIS

1. CONSTRUCTION

Since there was initially a possibility of covering the structure with either soil or concrete, a loading system was designed with these eventualities in mind. The loading floor was designed to serve not only as a deadman for loading the structure but also as a system that could be used to conduct moment-rotation tests on portions of the structure with varying thicknesses of concrete cover. This reinforced concrete floor was 16 ft wide, 32 ft long, and 8 ft thick with screw type inserts for tiedowns. To minimize support settlement and spreading, wing walls and horizontal tie bars were included. Figure 18a shows the formwork and reinforcing steel used in the loading floor. The concrete was placed in 2-ft lifts with the first three lifts being 2,500-psi concrete and the top lift 4,000-psi concrete. An overall view of the loading floor, wing walls, and footings, prior to backfilling, is shown in figure 18b. Figure 18c shows in greater detail the screw anchor inserts. These inserts are on 2-ft centers and each one has a "pullout" strength of approximately 80 kips. The completed loading floor after backfilling is shown in figure 18d.

To determine the best method of erection, single, double, and triple arches were assembled on the ground and lifted into place with a crane. The double-arch procedure proved to be the best and was consequently used in subsequent construction. Since tests were planned for three different shelter lengths, two arches were omitted during construction. Figure 19a shows the structure partially completed and figure 19b shows the structure ready for the first series of tests.

2. LOADING AND INSTRUMENTATION SYSTEMS

The loading system was constructed by attaching double-acting rams to the loading floor. Force links were then connected from the rams to the cables by means of a pin at one end and a free-turning swivel at the other end. The cables were then extended to the structure and connected to U-nuts which were attached to 1-inch-diameter high-strength full-threaded bolts. The bolts passed through both the metal and short sections of 4- x 4-in. timber which

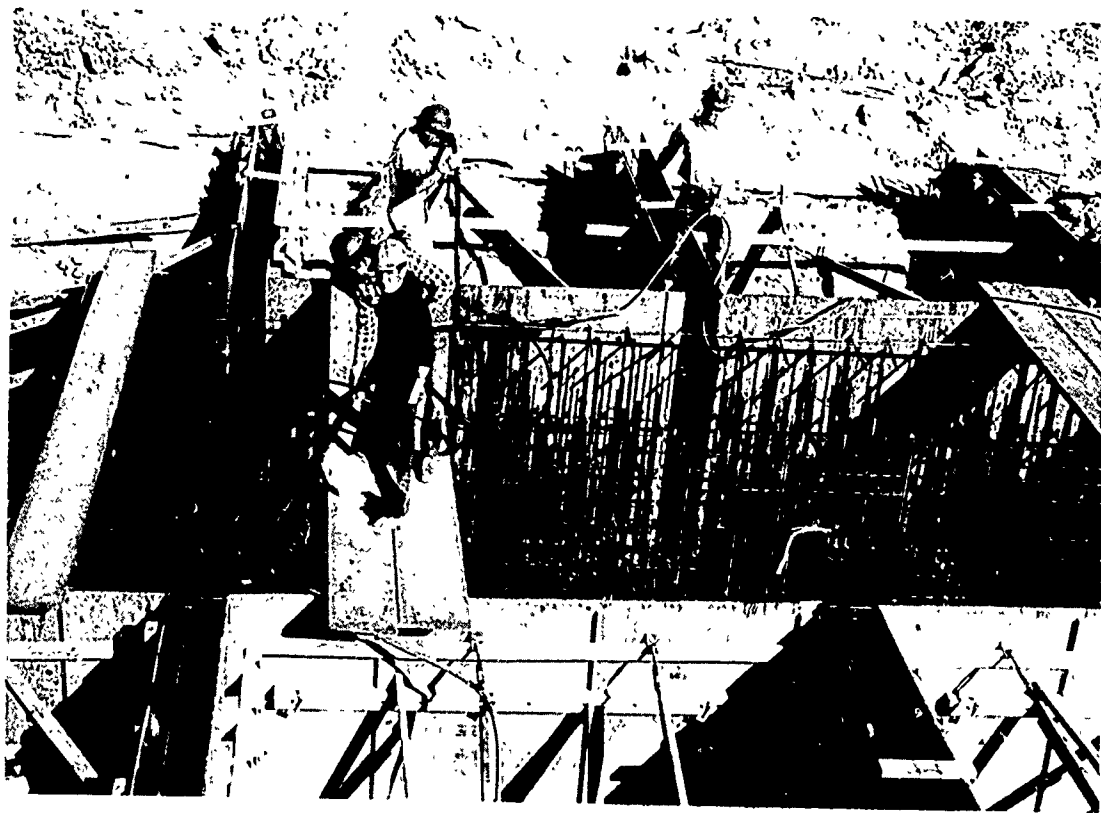
were partially encased in metal channels. The tops of the bolts were then double-nutted. This arrangement is shown in figure 20. Hydraulic pressure was supplied to the rams by means of the air-actuated pump shown in figure 21.

Although the force in the cables could have been approximated by recording the hydraulic fluid pressure, the use of strain gaged force links provided a much more accurate record of the force in the individual cables. Figure 21 shows the two 10-channel switch and balance units and the portable strain indicator that were used to determine the cable forces. The force links were calibrated so that 1 μ in./in. of strain represented 10 lb of force.

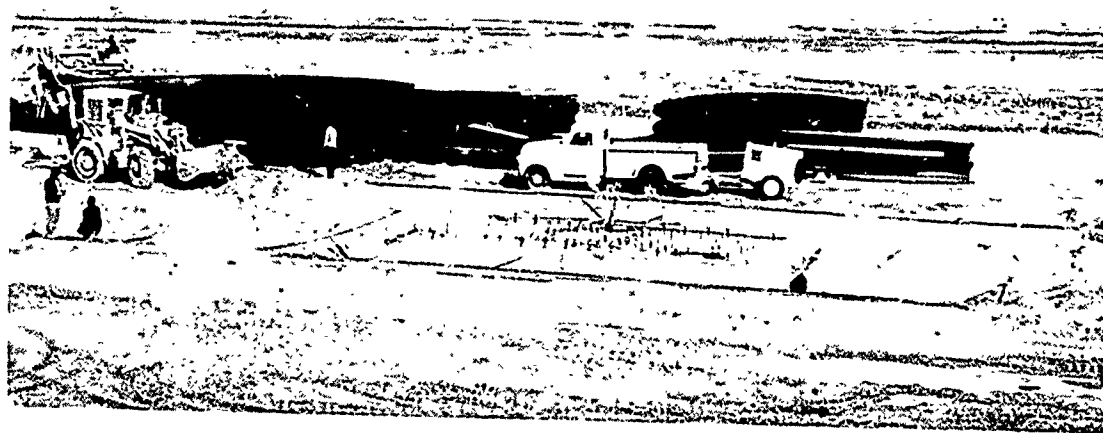
Horizontal and vertical deflections were measured at 35 locations on the structure as shown in figure 22. This measuring method consisted of two horizontal strands of piano wire (vertical separation of approximately 2 ft) stretched perpendicular to the longitudinal axis of the structure at five locations. These wires were attached to standards which were independent of the structure. Thirty-five weights were then suspended from the structure with piano wires in such a way that each one intersected with a pair of the horizontal wires. Short strips of measuring tape (1/16-in. markings) were attached to the vertical wires and to one horizontal wire in each pair. This arrangement (fig. 23) provided good records when read with a transit.

5. TYPES OF TESTS

Since one question to be answered in this research endeavor was whether the structure exhibited primarily arch or shell action, three series of tests were conducted on different structure lengths. The first seven tests were made on 30 linear ft of the shelter with the loads distributed throughout the entire length. The second seven tests were conducted on 52 linear ft of the structure with loads applied on a 30-ft portion from one end. Finally, seven tests were made on 74 linear ft of the structure with loads applied on the center 30 ft. Figure 24 shows the arrangement of the loads. Not all hydraulic rams were acting on all tests. Table I gives the type of tests, structure length, and type and amount of loading for the full-scale test series.

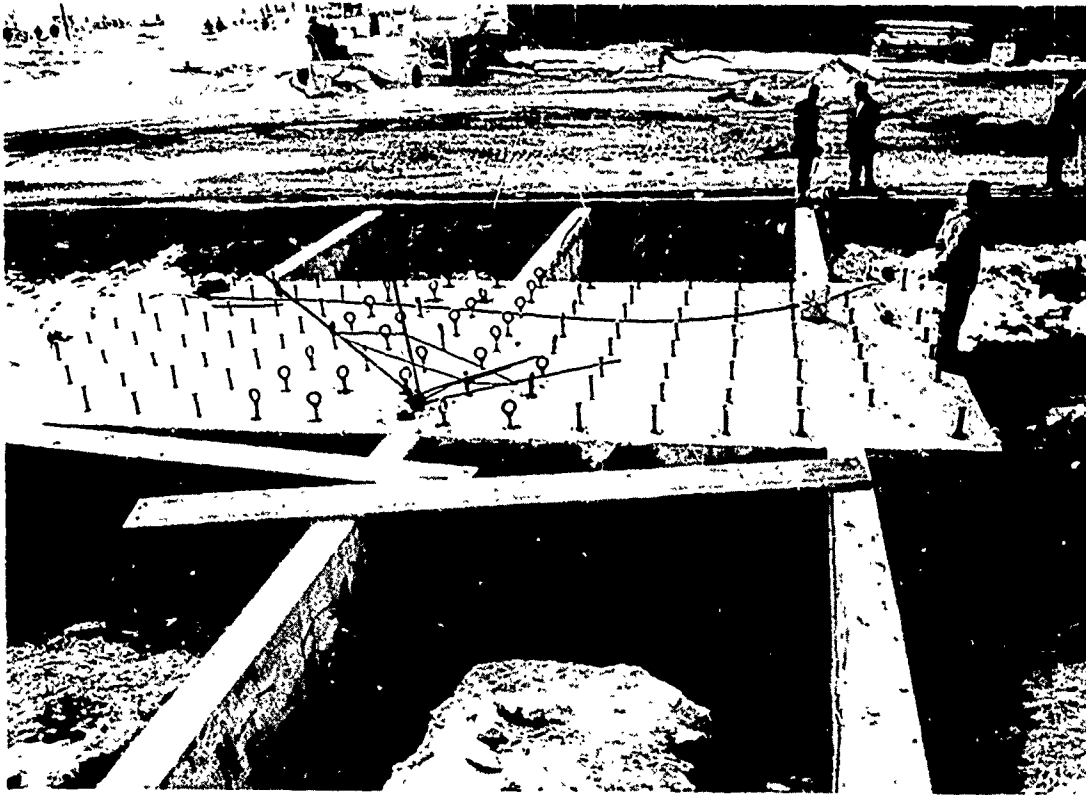


(a) Reinforcing Steel Layout

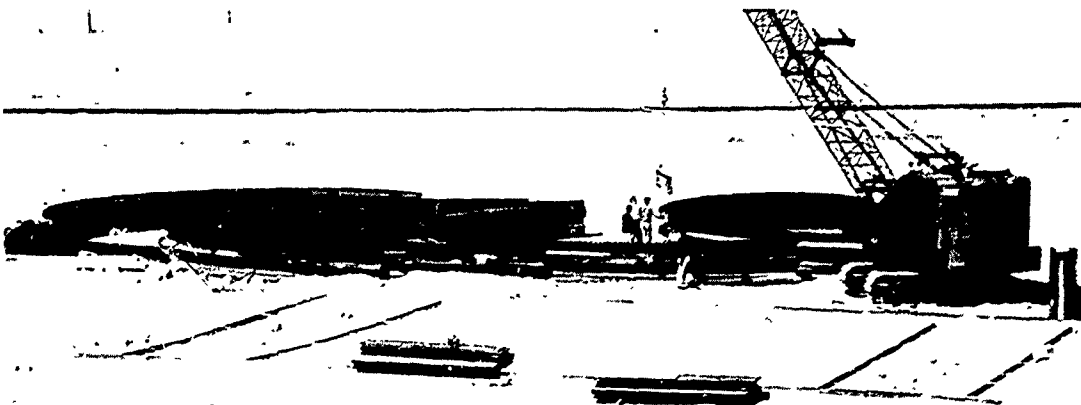


(b) Loading Floor Prior to Backfilling

Figure 18. Construction of Loading Floor

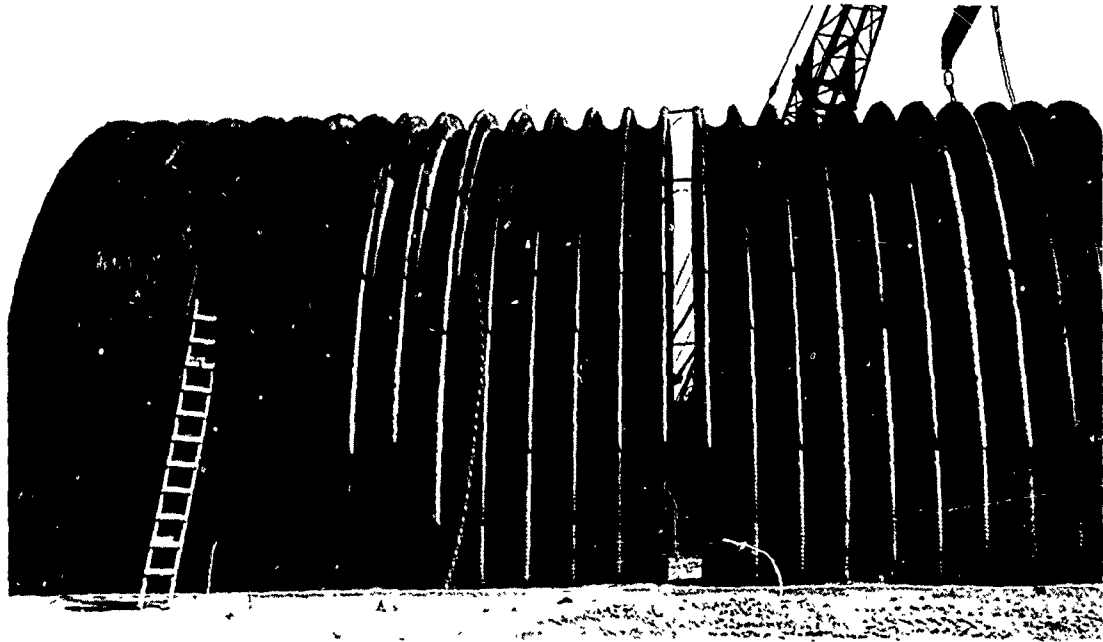


(c) Loading Floor Showing Tiedowns and Wing Walls

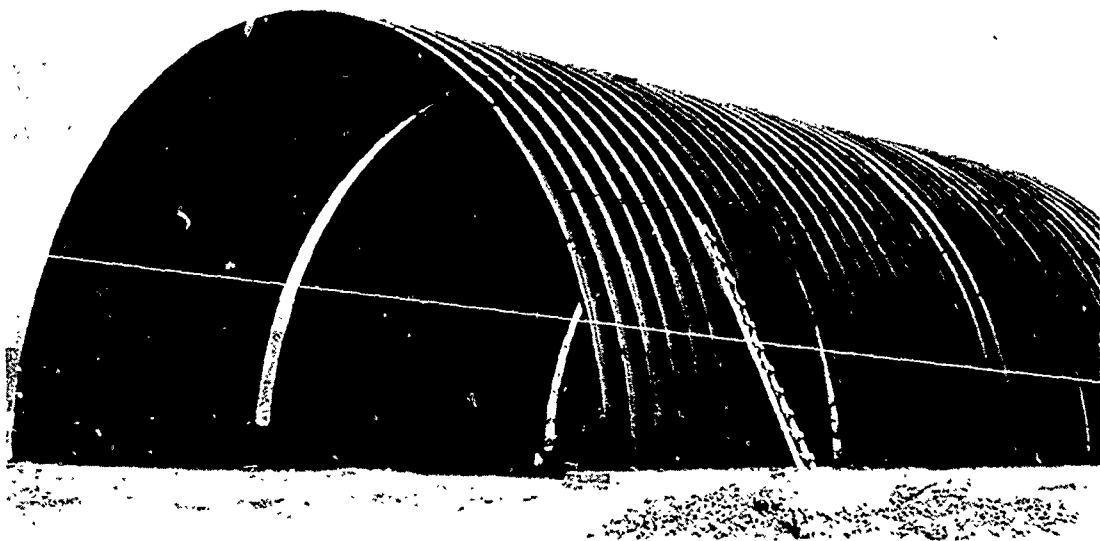


(d) Loading Floor After Backfilling

Figure 18---Concluded

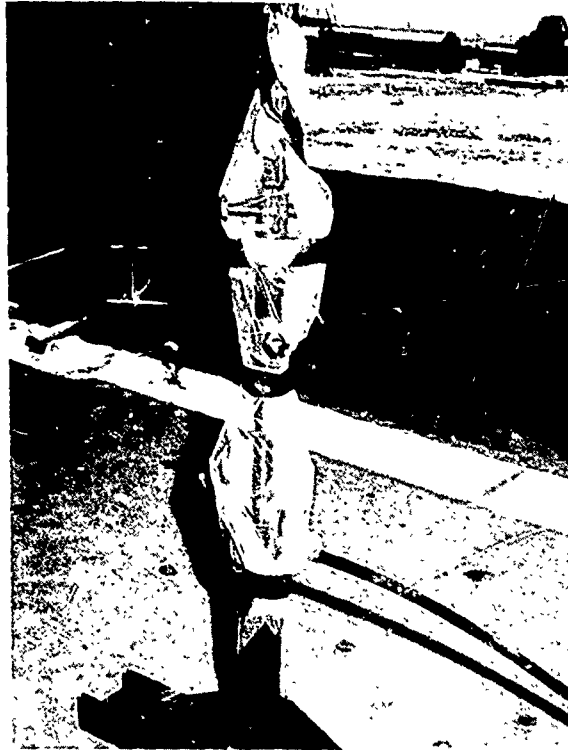


(a) Shelter Under Construction

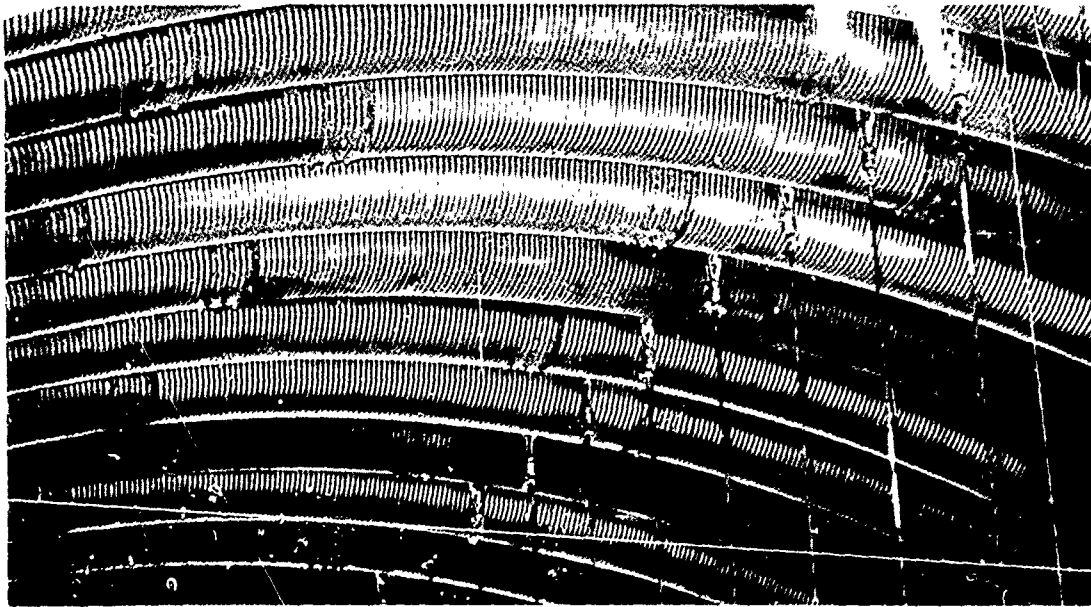


(b) Completed Shelter

Figure 19. Shelter for First Test Series



(a) Hydraulic Ram and Force Link



(b) Loading Cables

Figure 20. Loading System

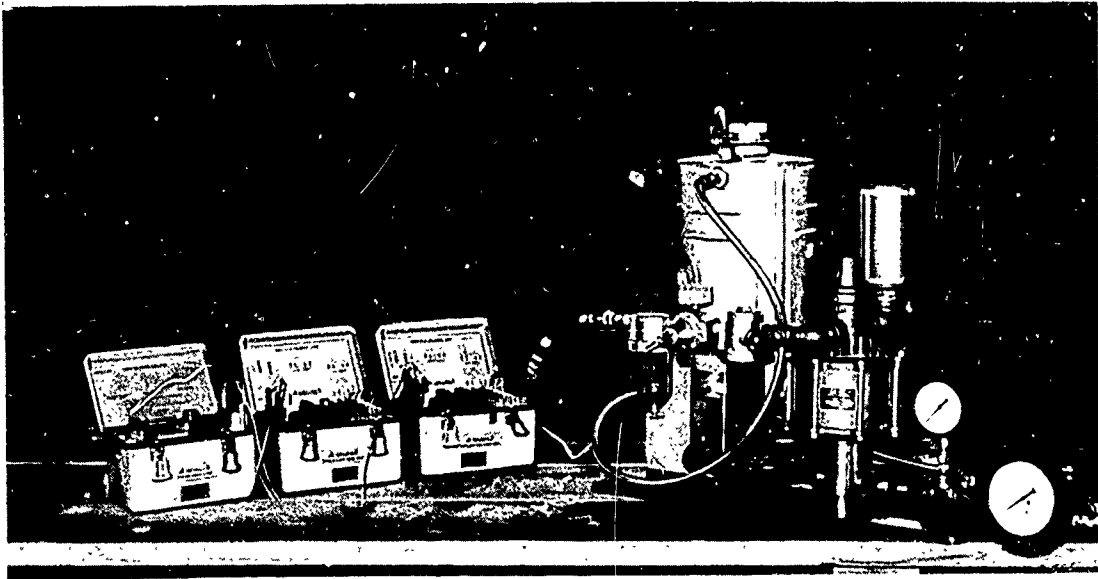


Figure 21. Load-Producing and Load-Measurement Systems

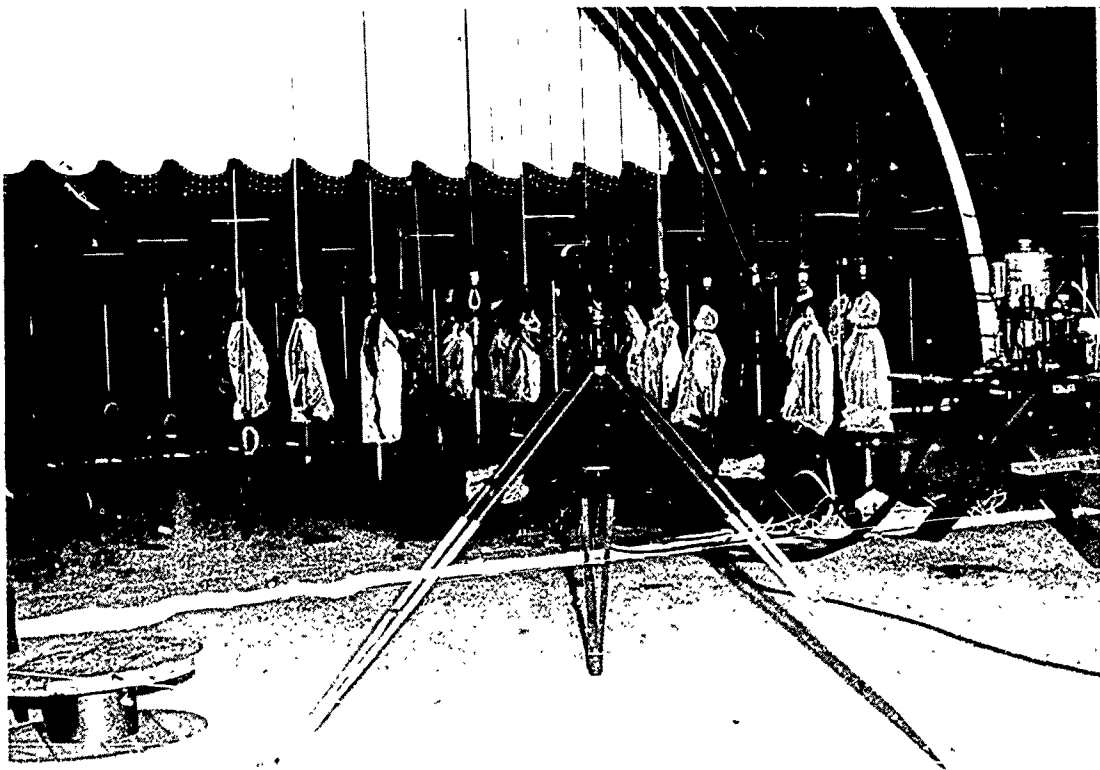


Figure 22. Deflection-Measurement System

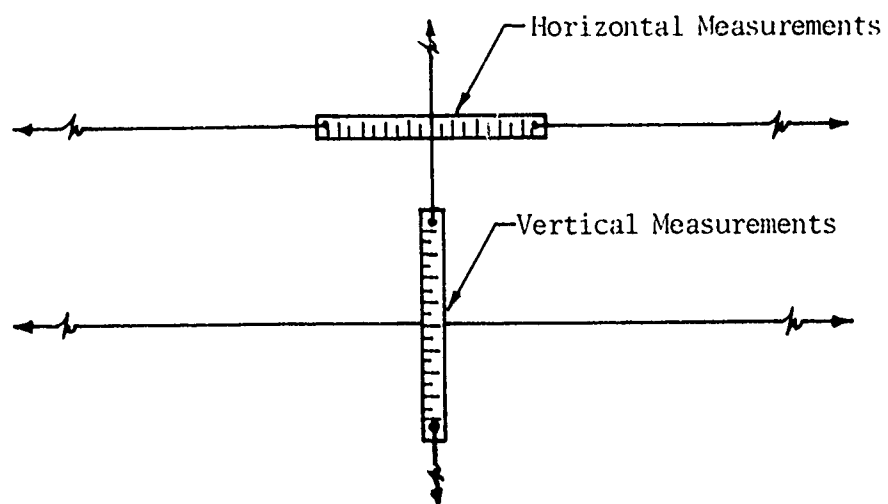


Figure 23. Deflection-Measurement Detail

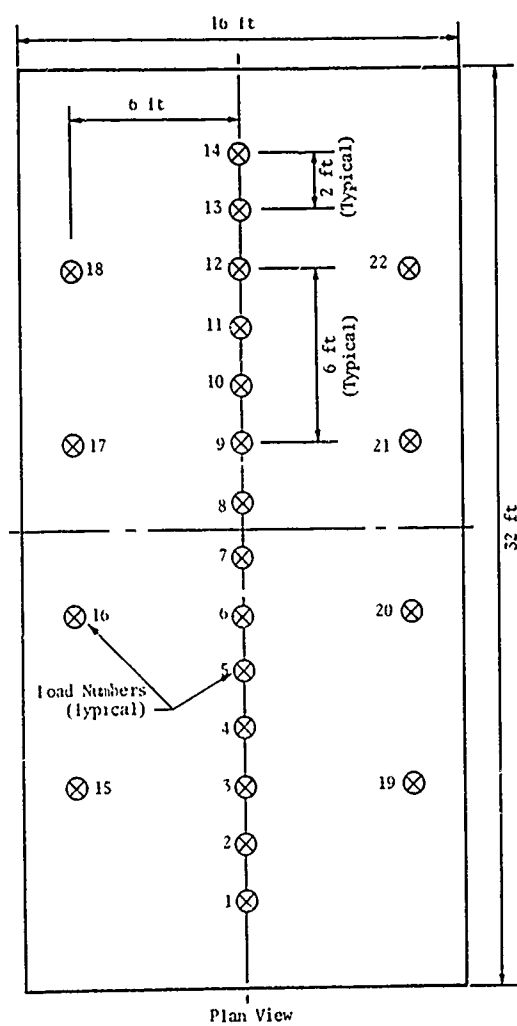


Figure 24. Applied Loads

Table I
FULL-SCALE TESTS

Test Number	Type of Test	Structure Length, ft	Loading Load Numbers Acting (See fig. 24 for load numbers)	Average Maximum Load per Ram, lb		Total Load, lb
				Side Rams	Center Rams	
2	Symmetric	30	1 through 14	0	4,956	69,385
3	Symmetric	30	A11 22	3,434	2,940	68,607
4	Unsymmetric	30	1 through 14, 19 through 22	3,539	2,970	55,690
5	Unsymmetric	30	1 through 18	3,598	2,980	56,090
6	Symmetric	30	15 through 22	5,981	0	47,850
7	Unsymmetric	30	19 through 22	8,020	0	32,080
8	Unsymmetric	30	15 through 18	7,962	0	31,850
102	Symmetric	52	1 through 14	0	6,044	84,425
103	Symmetric	52	A11 22	4,048	3,450	80,784
104	Unsymmetric	52	1 through 14, 19 through 22	4,793	4,010	75,200
105	Unsymmetric	52	1 through 18	4,766	3,980	74,645
106	Symmetric	52	15 through 22	7,806	0	62,450
107	Unsymmetric	52	19 through 22	8,130	0	32,520
108	Unsymmetric	52	15 through 18	8,108	0	32,430
202	Symmetric	74	1 through 14	0	6,010	84,055
203	Symmetric	74	A11 22	4,138	3,490	81,960
204	Unsymmetric	74	1 through 14, 19 through 22	4,783	4,010	75,320
205	Unsymmetric	74	1 through 18	4,791	4,020	75,565
206	Symmetric	74	15 through 22	7,888	0	63,100
207	Unsymmetric	74	19 through 22	8,175	0	32,700
208	Unsymmetric	74	15 through 18	8,088	0	32,350

Tests were numbered as follows: the first series (30-ft shelter) is numbered 2 through 8; the second series (52-ft shelter) is numbered 102 through 108; and the last series (74-ft shelter) is numbered 202 through 208. Consequently, to determine whether the structure behaves like an arch or a shell, comparisons must be made among tests ending in the same number. To facilitate such a comparison, table II is presented to show the effect of structure length on the centerline deflections. The last column is a normalized load/deflection computation in which the lowest value of P/Δ is taken as the reference and the other two tests using the same loading are then referred to it. The lowest value was taken so the percentage difference could be automatically presented. For example, consider tests 5, 105, and 205. With test 205 as the reference, it is obvious that test 105 differs by almost 3 percent and test 5 differs by over 6 percent. Furthermore, it can readily be seen from such comparisons that the structure exhibits essentially arch behavior and, consequently, the length effect is negligible.

4. NUMERICAL ANALYSIS AND COMPARISONS TO EXPERIMENTAL RESULTS

The numerical analysis developed in this investigation is based on a discrete element idealization technique which uses the beam element developed in section II. The grid systems used for each of the test cases were as follows:

Test Series	Test Case	Grid System	Reference
1	5, 8	20 x 10	Grid layouts are contained at the end of the report.
1	2, 3, 6	10 x 10	
2	102, 103, 106	10 x 15	
3	202, 203, 206	10 x 20	

All test problems except 5 and 8 were symmetrically loaded and, consequently, the grid represents only one-half the structure for most cases. The grid systems were chosen with as many degrees of freedom as possible while utilizing only the central core memory of the computer.

Since the structure was constructed of doubly corrugated steel panels which have essentially no areas free of small corrugations or holes, strain measurements were not attempted. Deflection measurements were taken during each test and these results were compared to the analytical predictions (fig. 25). Horizontal deflections were not recorded in test 2 because the measuring system had not reached the final stage of refinement. However, in all subsequent tests, horizontal measurements were recorded.

Table II
CENTERLINE DEFLECTION VERSUS TOTAL LOAD COMPARISONS

Test Number	Total Load (P), lb	Centerline Deflection (Δ), in.	P/ Δ , lb/in.	Normalized, P/ Δ
2 *	69,385	3.38	20,528	1.0159
102 *	70,070	3.44	20,369	1.0080
202 *	69,710	3.45	20,206	1.0000
3 *	61,740	3.49	17,690	1.0000
103 *	61,218	3.38	18,396	1.0399
203 *	62,720	3.48	18,023	1.0188
4 †	55,690	2.81	19,819	1.0104
104 †	56,100	2.86	19,615	1.0000
204 †	56,580	2.72	20,801	1.0295
5 †	56,090	2.61	21,490	1.0635
105 †	56,580	2.72	20,801	1.0295
205 †	56,575	2.80	20,205	1.0000
6 *	47,850	2.06	23,228	1.0000
106 *	46,610	1.97	23,660	1.0185
206 *	57,048	2.00	23,524	1.0127
7 †	32,080	1.44	22,278	1.0000
107 †	32,520	1.31	24,824	1.1142
207 †	32,700	1.37	23,869	1.0714
8 †	31,850	1.50	21,233	1.0000
108 †	32,430	1.37	23,672	1.1148
208 †	32,350	1.38	23,442	1.1040

* Symmetric loading.
† Unsymmetric loading.

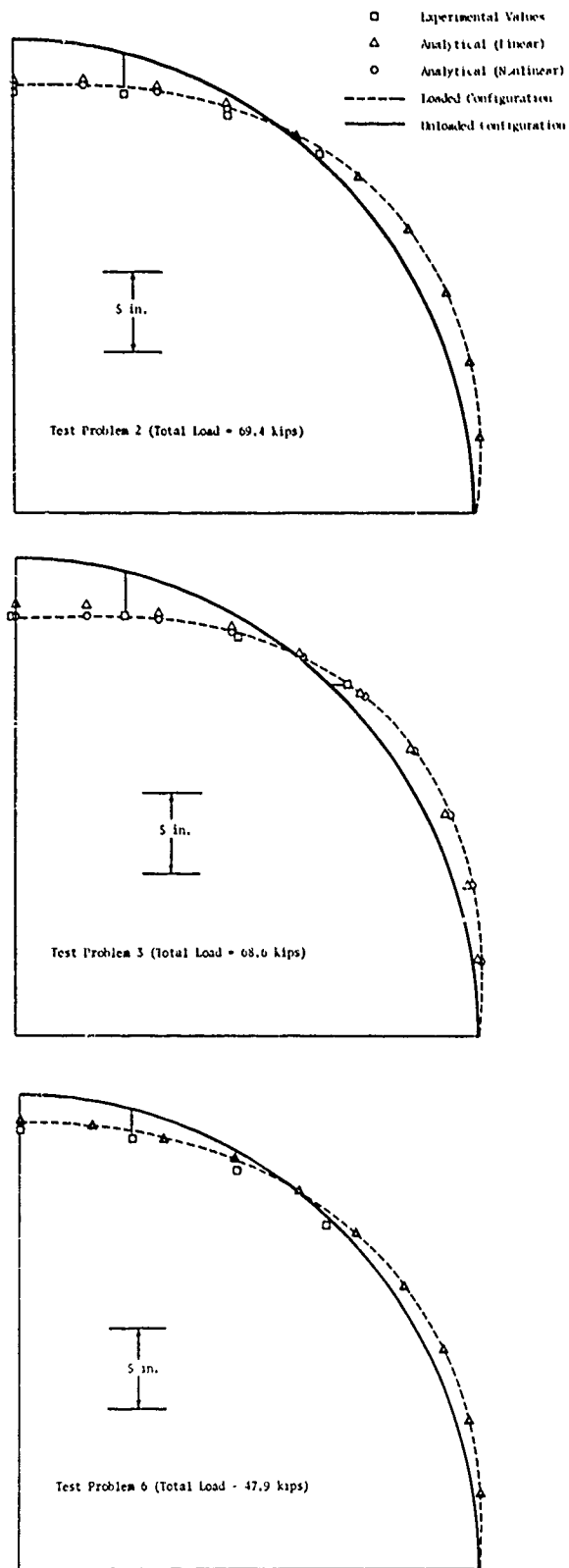


Figure 25. Analytical and Experimental Deflection Curves

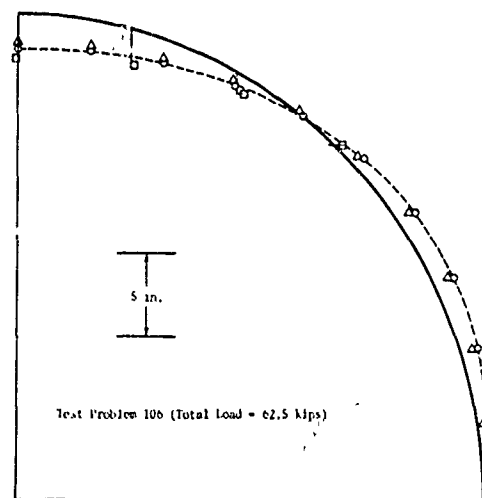
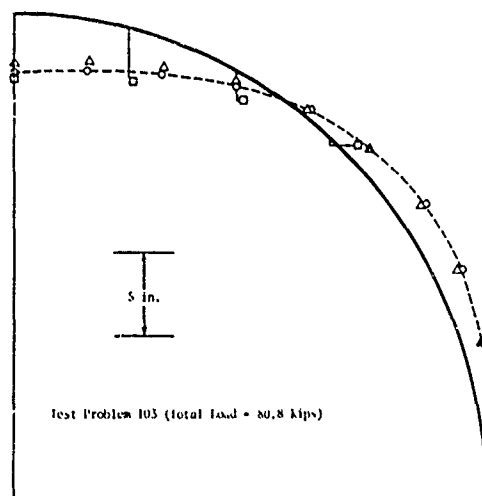
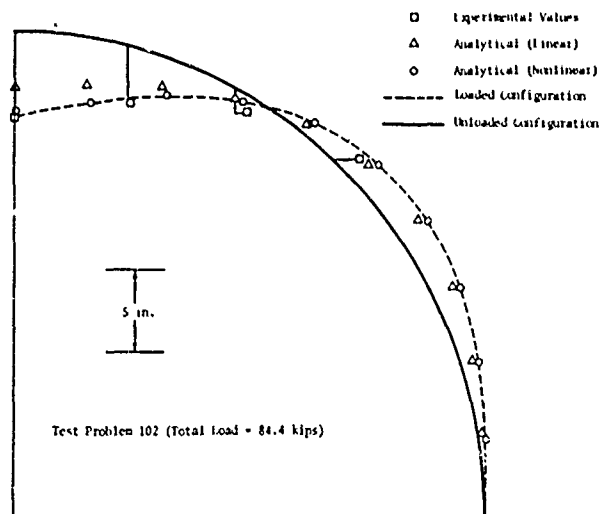


Figure 25---Continued

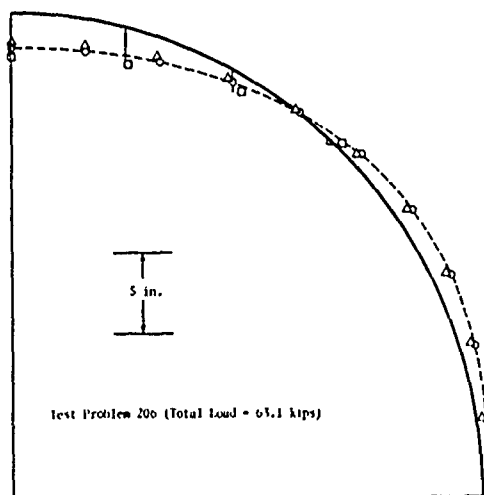
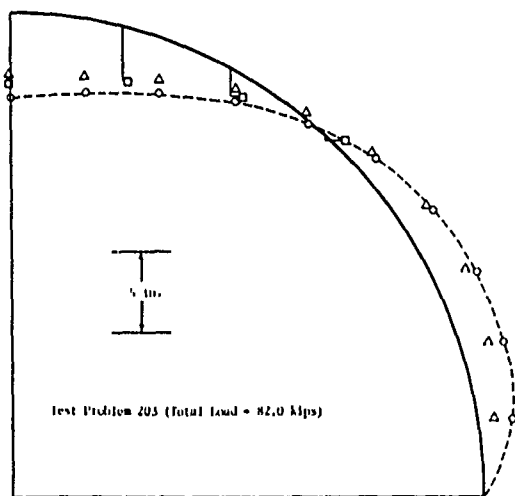
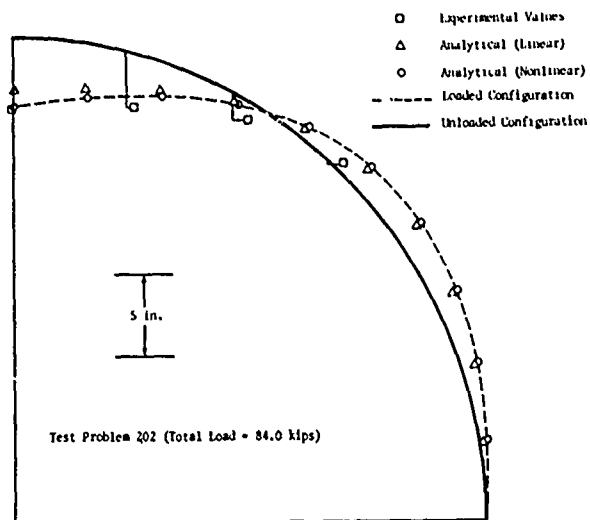


Figure 25---Continued

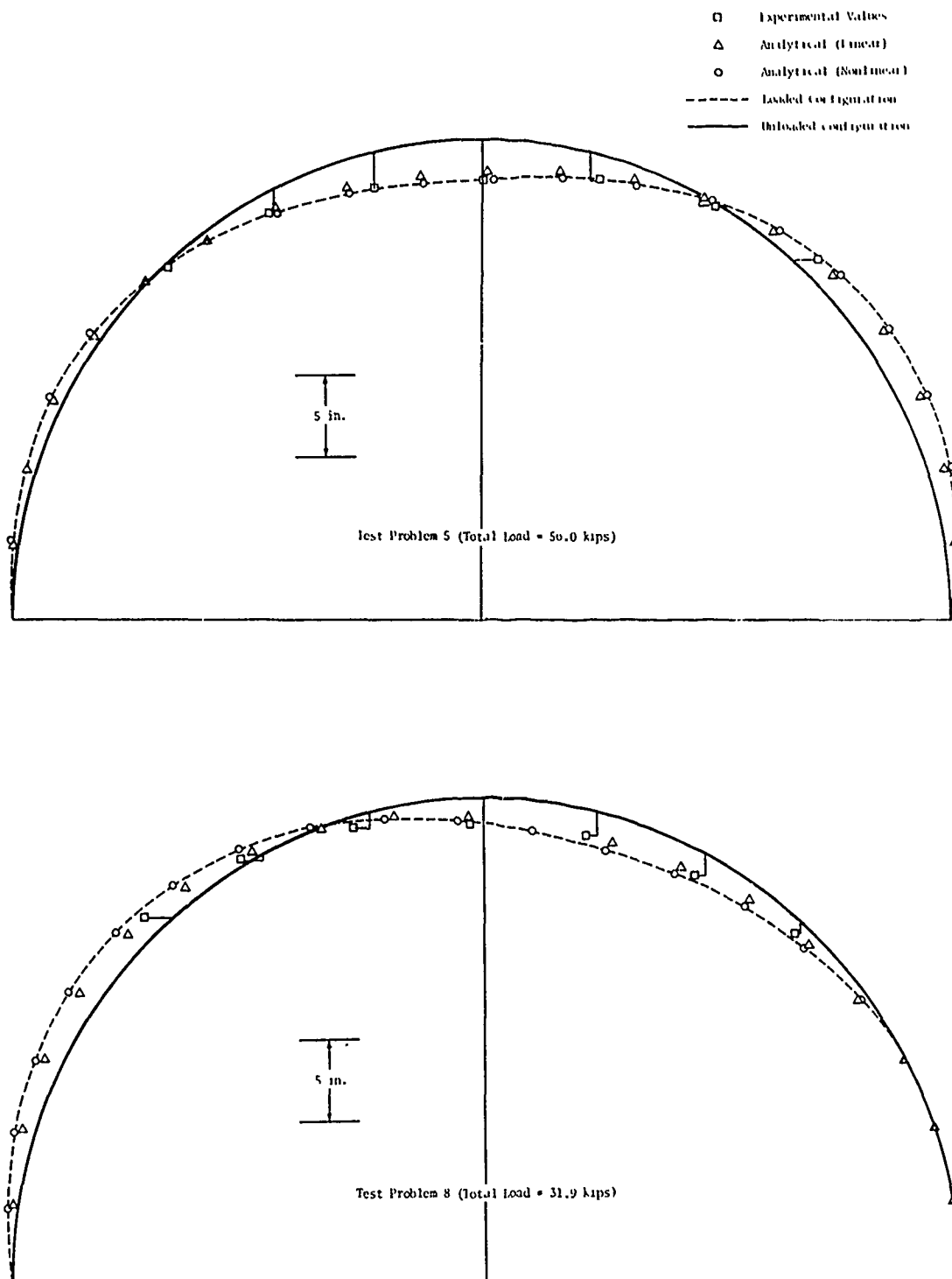


Figure 25---Concluded

Although 22 full-scale tests were conducted, only 11 are presented here. The first test was considered a "shake-down" and was conducted in an attempt to remove the effects of bolt misalignment and other irregularities caused by fabrication and construction. The results of two of these tests were disregarded because of high wind in one instance and rain in the other. Because of the limited computer storage capacity, analytical solutions for the unsymmetrically loaded 52- and 74-ft-long structures were not obtained. Consequently, test results from the second and third test series involving unsymmetrically loaded structures will be presented in the future.

Figure 26 is presented to give the reader an idea of the response of the crown when subjected to various load configurations. No scale is shown since these plots (from program presented in appendix II) are for the linear analysis only and essentially the same information may be obtained from figure 25.

It has been noted that no strain measurements were taken and, consequently, no experimental stress values can be presented. However, in order to develop an insight into probable stress patterns, an approximate stress analysis was performed for a selected number of the test problems. These plots, shown in figure 27, are useful only for predicting regions of high stress and are not intended for design purposes. The stress distribution of test problem 3 is with fixed supports while all others are based on simple supports. The question of the degree of fixity at the base was studied and it was concluded that for the loading considered in this investigation, the hinged condition was more representative of the actual conditions. The main reasons for this conclusion were (1) the base plates, to which the structure was attached, were secured to the footings in such a way as to allow some rotation, and (2) the panels were bolted to the base plate in a staggered manner so that the bolts along the outside and inside were 2 ft apart and the holes were considerably larger than the bolts. It is believed, however, that for high load intensities, the slack will be taken out of the system and the fixed base condition will be more representative. This presents a rather difficult problem if the support response becomes a function of the load intensity.

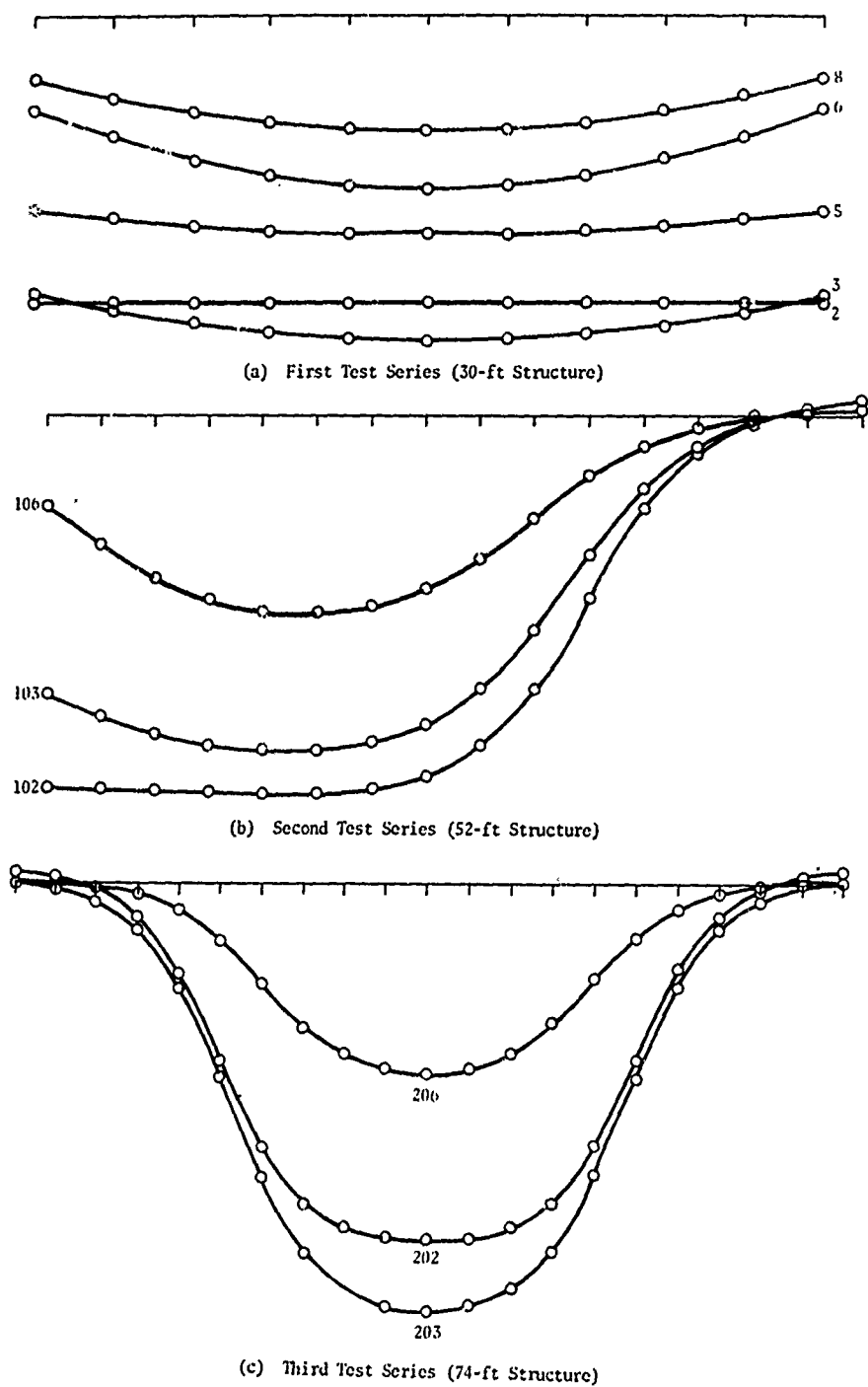
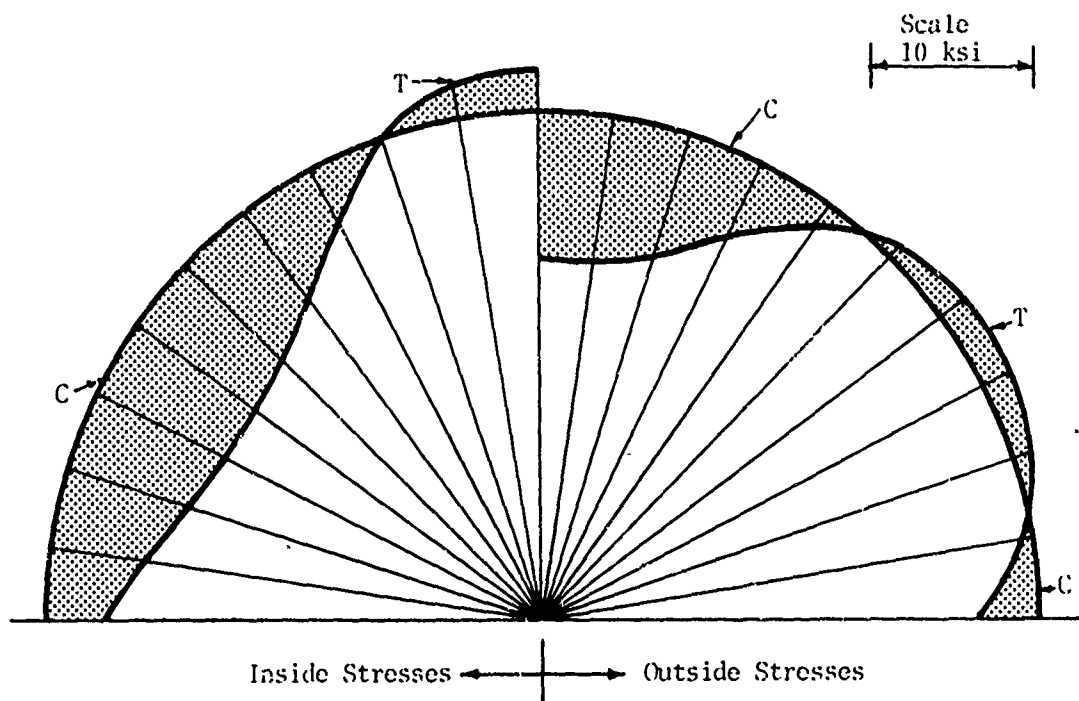
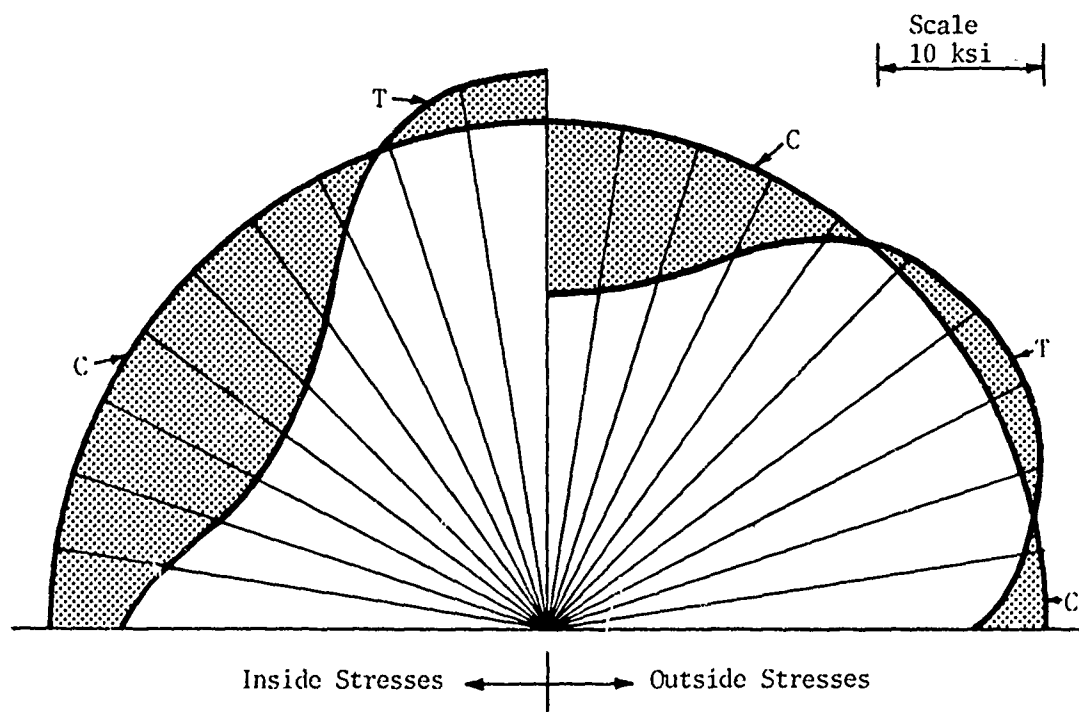


Figure 26. Crown Displacements (Linear Analysis)



(a) Test Problem 6



(b) Test Problem 106

Figure 27. Comparative Stresses on Inside and Outside Fibers

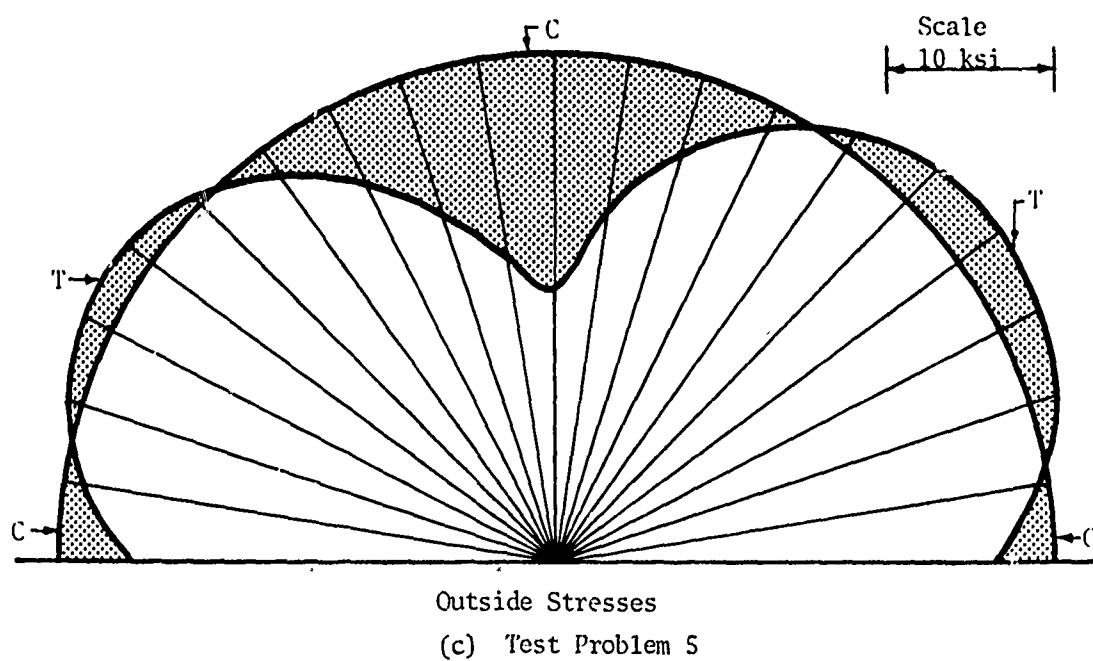
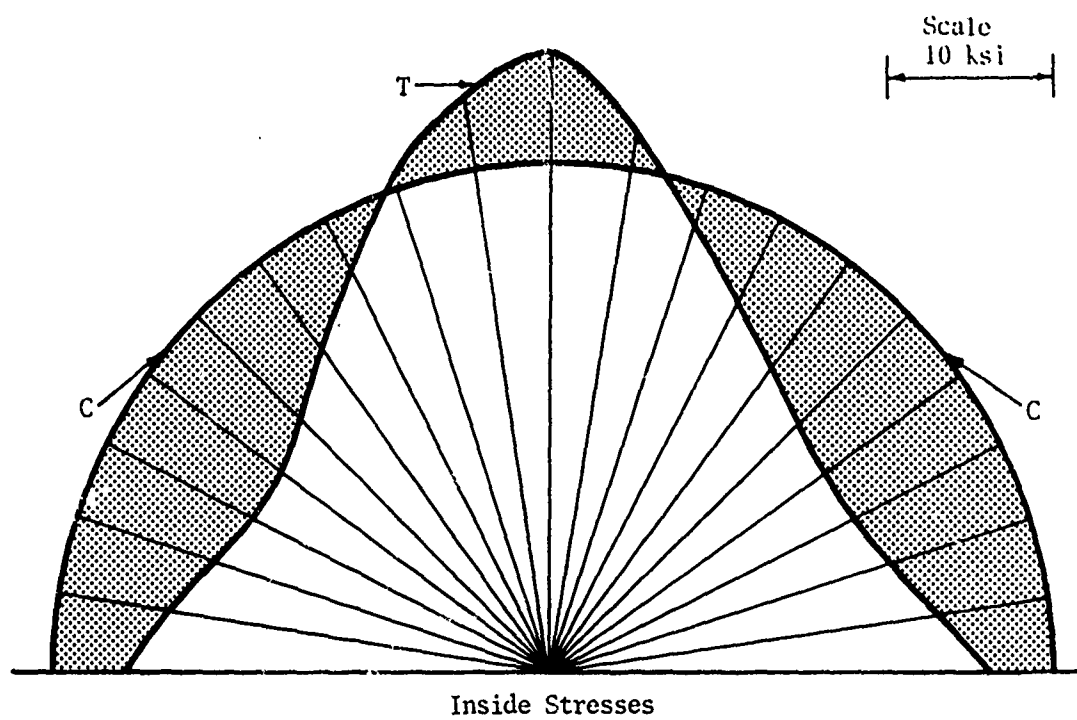
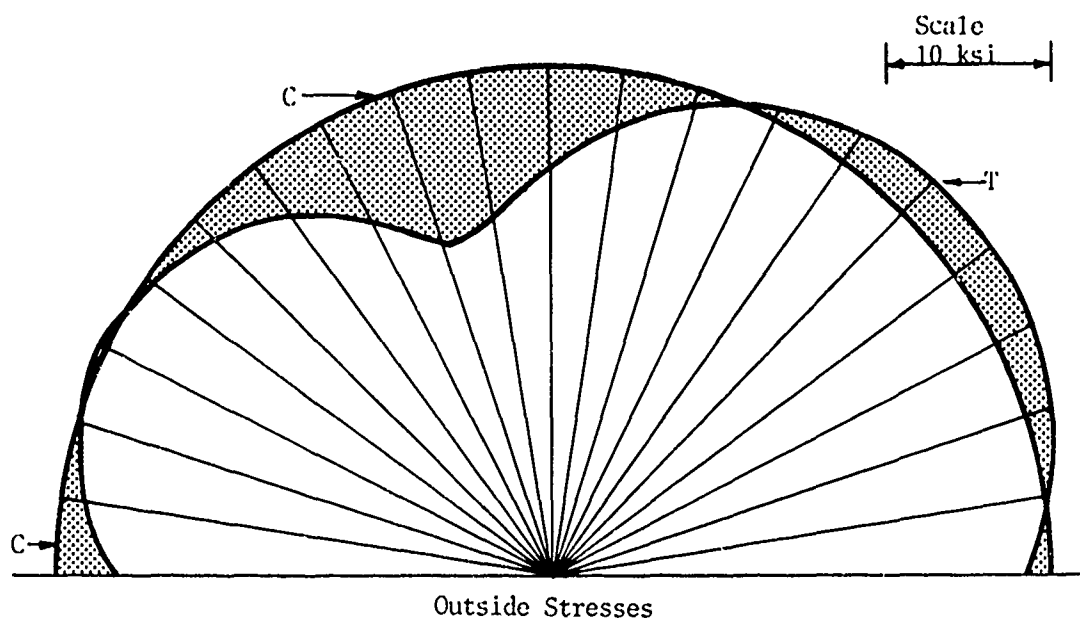
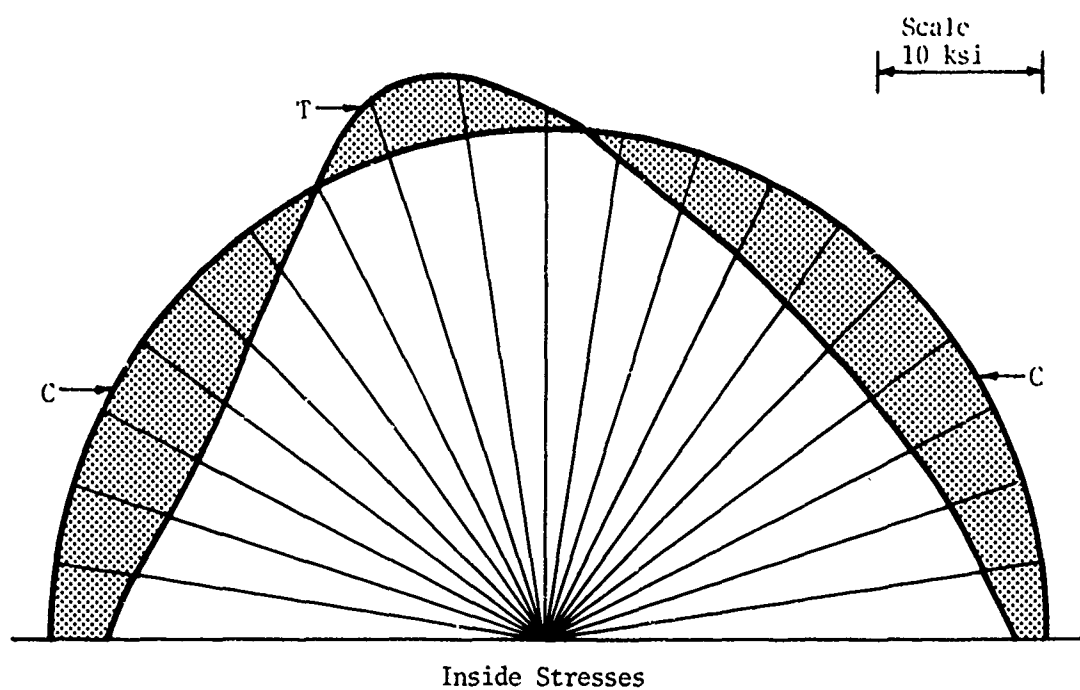
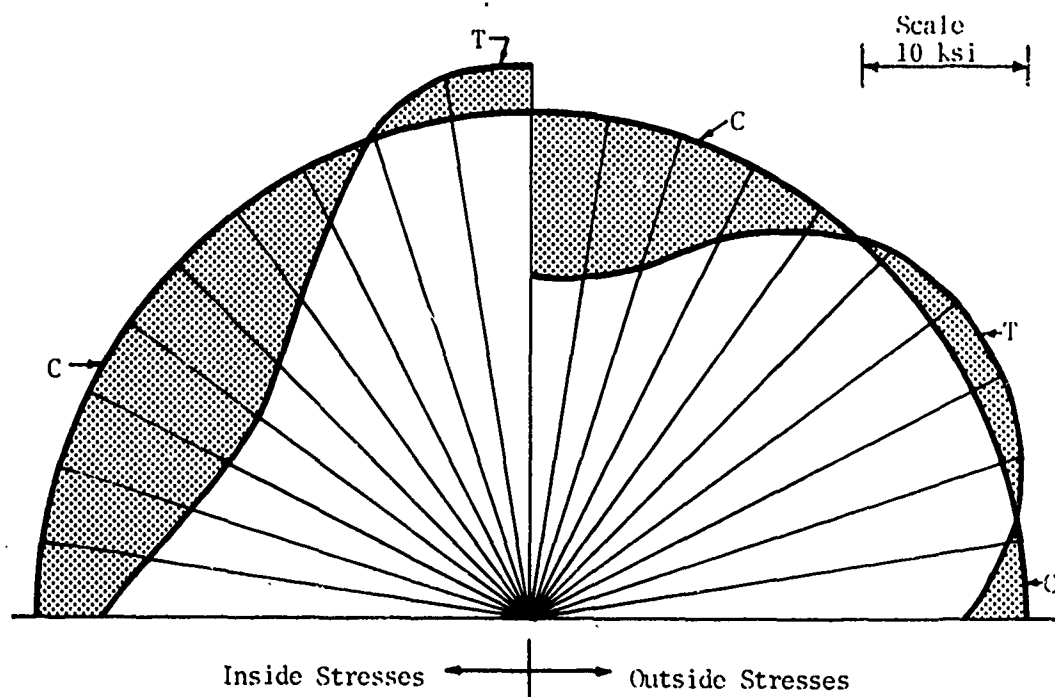


Figure 27---Continued

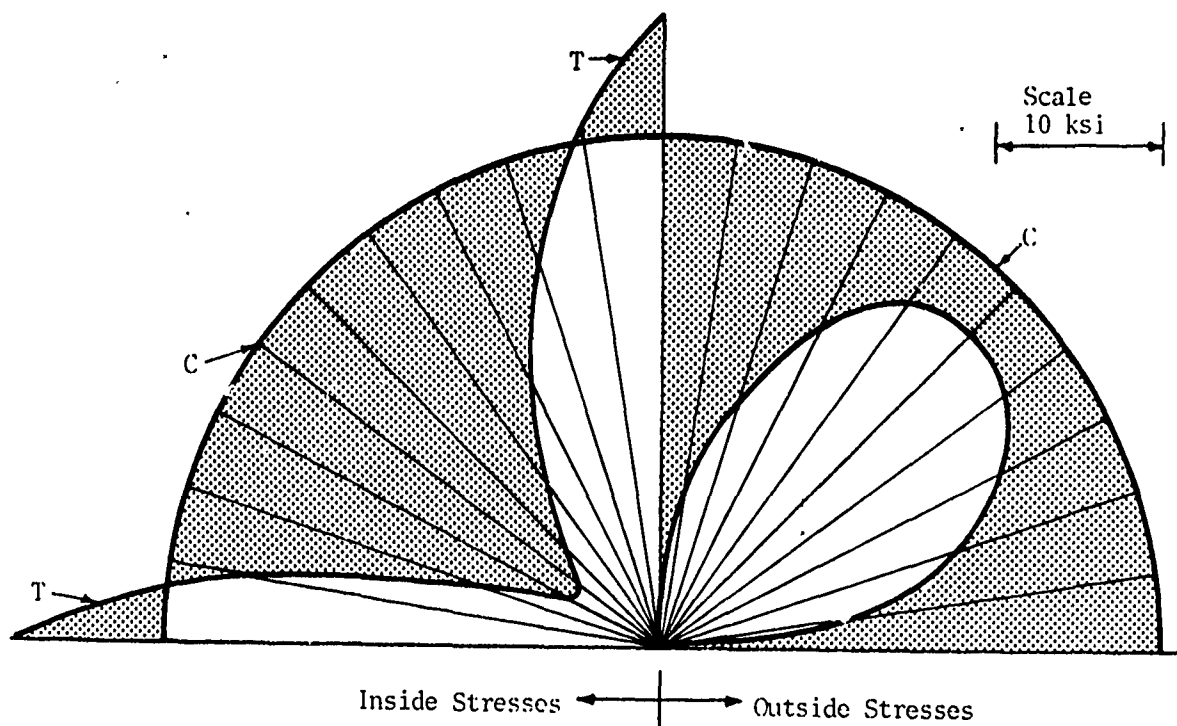


(d) Test Problem 8

Figure 27---Continued



(e) Test Problem 206



(f) Test Problem 3

Figure 27---Concluded

SECTION V

CONCLUSIONS

The following conclusions have been made as a result of this investigation of a doubly corrugated steel aircraft shelter.

- (1) The initial response of the structure can be predicted with reasonably good accuracy by treating it as a linear elastic problem without conducting moment-rotation and force-deformation tests on individual panels. However, the cross-sectional properties (such as the moment of inertia and the centroid) cannot be taken from existing manufacturers' tables since this information ignores the effect of the small corrugations. Rather, simple tests must be made to determine the apparent modulus of elasticity of longitudinal strips at different locations within the cross section. This information can then be used to develop a transformed section which includes the effect of the small corrugations. When a future requirement for the analysis of different doubly corrugated sections arises, this approach can result in a significant savings since the new panel concepts do not have to be fabricated prior to an initial analysis.
- (2) There is approximately a 10- to 15-percent variation (depending upon the loading conditions) resulting from treating the structure first as an arch and then as a shell.
- (3) For the loadings used in the full-scale testing program, the nonlinear solutions differed by approximately 15 percent from the linear solutions. However, for loads which could result in incipient collapse, the nonlinear and linear analyses could differ by several hundred percent.

APPENDIX I
COMPUTER PROGRAMS

1. INTRODUCTION

Although the computer program, SANOS (*Structural Analysis of Nonlinear Orthotropic Shells*), was developed specifically for the analysis of the structure described in section I, it is not restricted to such structures. The program is designed so that virtually any structural geometry (symmetric or unsymmetric) can be handled with slight modifications.

A companion program, SAN1PLT, was written to plot the results from SANOS which expedites interpretation of the grid system, loading, crown and arch displacements, moments, axial forces, and comparative stresses on inside and outside fibers.

Sample input and output for the SANOS program are presented in appendix III and IV, respectively.

2. COMPUTER PROGRAM SANOS

<u>Card Number(s)</u>	<u>Explanation</u>
1	Control card
2 through 11	Dimension statements (These would require changes to increase the number of elements used.)
12 through 18	Common blocks
19 through 83	Format specifications for input and output information
84 through 99	Read statements and comment cards for input data
100 through 110	Initialization of certain parameters
111 through 116	Calculating dimensions and central angles
117 through 119	Initialization of support information vectors
120 through 129	Reading and arranging support information
130 through 144	Initialization of parameters
145 through 146	Reading load vector
147 through 182	Printing input information
183 through 230	Calculating and printing nodal coordinates
231 through 280	Calculating and printing element properties
281 through 287	Printing support and loading information

<u>Card Number(s)</u>	<u>Explanation</u>
288 through 289	Storing loading information for later use
290 through 291	Calling subroutine BAND to determine the indexing matrices for banding the stiffness matrix
292 through 430	This phase is a DO loop that applies a certain percent of the load, generates the differential stiffness matrix, solves the equations, and integrates the internal moments, axial forces, and displacements. This process is repeated until the full load is applied. During the first pass through this section, subroutine PRNT is called which calculates and prints the linear analysis.
431 through 446	Checking auxiliary tapes and storing information to be used as input to plot routine SAN1PLT
447	End of main program
448 through 481	<u>Subroutine EQSOL</u> --Solves the equations for the displacements
482 through 511	<u>Subroutine PACK</u> --Assembles the master stiffness matrix
512 through 542	<u>Subroutine BAND</u> --Determines indexing matrices required for banding the stiffness matrix
543 through 552	<u>Subroutine MULT</u> --Obtains the product of two matrices
553 through 562	<u>Subroutine MTRAN</u> --Multiplies one matrix by the transpose of another
563 through 601	<u>Subroutine CMPAT</u> --Generates the compatibility matrix for each element
602 through 629	<u>Subroutine ELEMK</u> --Generates the elemental stiffness matrices
630 through 830	<u>Subroutine PRNT</u> --Calculates, prints, and sets up data for plot routine SAN1PLT for the linear solutions

```

      SANOS
1  PROGRAM SANOS(INPUT,OUTPUT,TAPE7,FILMPL)
2  DIMENSION T(830),XIX(130),AREA(830),PM(830),JEM(830),KEM(830),
3  2      XJ(830),YJ(130),ZJ(830),XK(830),YK(830),ZK(830),
4  3      IX(1155),O(1155),JBLN(1155),JBR(1155),NS(1155),
5  4      NSP(1155),Z(1155),X0(1155),AXIAL(830),PULT(830),
6  5      SOM(1660),SOM2(1660),SUM(1660),
7  6      S(65,1155),
8  7      TK(10,10),B(10,10),P(10),SB(10,10),ES(10,10),
9  8      OD(10),P2ENT(30),CRS(21),SRN(21),NP(5),
10 9      Y(231)
11 * ,MMTYP(830)
12 COMMON /2/ X(231), Z(231), PLOTAX(220),
13 1PLOT4J(220),PLOT4K(220),STRSOJ(220),STRSIJ(220),STRSOK(220),
14 2STRSIK(220),MAYGLE
15 COMMON/3/NBAYL,NBAYW,NPRO3
16 COMMON/4/PLOTN
17 COMMON/5/CA,JPRO3,NU4PR
18 REAL _SUM
19 232 FORMAT(3I3,I11)
20 301 FORMAT(8I10)
21 362          FORMAT(1H0)
22 420 FORMAT(20X14H2303LEM NUMBER I5/)
23 421 FORMAT(16X,41H NONLINEAR ANALYSIS OF ORTHOTROPIC SHELLS )
24 422 FORMAT(14X,45H MATERIAL NONLINEARITY ** RICHARD FORMULATION )
25 424 FORMAT(49H NUMBER OF RUNGE-KUTTA INTERVALS ***** NRK = I5)
26 425 FORMAT(49H NUMBER OF MEMBERS ***** NM = I5)
27 426 FORMAT(49H NUMBER OF LOADS ***** NLOAD = I5)
28 427 FORMAT(49H NUMBER OF SUPPORTS ***** NSUPS = I5)
29 428 FORMAT(49H BAND WIDTH ***** NBAND = I5)
30 430 FORMAT(49H CURVE FITTING PARAMETER ***** R =F9.2)
31 440 FORMAT(53H *****SHELL GEOMETRY***** )
32 441 FORMAT(61HOMN J4 <M AREA ULT.FORCE SECMO JL
33 1T.MO4, 8X,6HLENGTH, 8X,5HMTYPE ,/)
34 442 FORMAT(3I4,5F12.3,I8)
35 450 FORMAT(18X24H RUNGE-KUTTA INTERVAL = I3)
36 451 FORMAT(26X8H MOMENTS)
37 452 FORMAT(120H MEMBER NO. MOM. AT J END MOM. AT K END SHEAR
38 1 AXIAL FORCE ULT. MOM. MJ/PM KJ/PM ULT. FORCE)
39 453 FORMAT(I7,4E17.5,4F11.3)
40 454 FORMAT(27X14H DISPLACEMENTS)
41 455 FORMAT(120H NODE DELTA X DELTA Y DELTA Z
42 1 THETA X THETA Y THETA Z )
43 456 FORMAT(I6,1E17.5,5E15.5)
44 459 FORMAT(I9,1P2E17.5)
45 460 FORMAT(10X29H THESE ARE THE ELASTIC FORCES//)
46 461 FORMAT(42H THESE ARE THE ELASTIC NODAL DISPLACEMENTS/)
47 494 FORMAT(49H THICKNESS OF SHELL (BENDING)***** THICKN =F9.2)
48 495 FORMAT(49H THICKNESS OF SHELL (AXIAL)***** THICKA =F9.2)
49 497 FORMAT(49H MODULUS OF ELASTICITY OF SHELL ***** E =F9.2)
50 502 FORMAT(49H NUMBER OF NODES ***** NODES = I5)
51 503 FORMAT(49H NUMBER OF EQUATIONS ***** NOD5 = I5)
52 504 FORMAT(49H NUMBER OF DAYS LONG ***** NBAYL = I5)
53 505 FORMAT(49H NUMBER OF DAYS WIDE ***** NBAYW = I5)
54 507 FORMAT(49H LENGTH OF DIAGONAL ELEMENTS ***** DIAG =F9.2)
55 510 FORMAT(53H*****THE NUMBER OF EACH SUPPORT***** )
56 511 FORMAT(12I5)
57 512 FORMAT(53H*****LOAD NUMBER AND LOAD***** )
58 514 FORMAT(I4,F9.3,I16,F9.3,I16,F8.3)
59 516 FORMAT(5F12.5)
60 517 FORMAT(53H*****PERCENTAGE OF LOAD ON EACH RUNGE-KUTTA INTERVAL**)
61 518 FORMAT(48H PERCENT OF TOTAL LOAD TAKEN IN THIS INTERVAL = F9.0)

```

```

52 519 FORMAT(48H0TOTAL PERCENT OF LOAD INCLUDED AT THIS TIME = F9.0)
53 550 FORMAT(1H1)
54 551 FORMAT(15X,40H PLASTIC ANALYSIS ** SMITH PLASTIC MODEL )
55 552 FORMAT(12X,48H GEOMETRIC NONLINEARITY ** INCREMENTAL TECHNIQUE )
56 600 FORMAT(1P3E20.9)
57 601 FORMAT(1P9E13.3)
58 620 FORMAT(49H HEIGHT OF STRUCTURE ***** HEIGHT =F9.2)
59 621 FORMAT(49H SPAN OF STRUCTURE ***** SPAN =F9.2)
60 623 FORMAT(49H CENTRAL ANGLE--DEGREES***** CAD =F9.2)
61 900 FORMAT(8F10.0)
62 901 FORMAT (1I10,1F10.0)
63 10004 FORMAT(49H THICKNESS OF SHELL (BENDING-WEAK AXIS) THICKW =F9.2)
64 10005 FORMAT(49H HALF BAND WIDTH PLUS DIAGONAL ***** NBSYM = I5)
65 10006 FORMAT(49H LENGTH OF SHELL ***** SENGTH =F9.2)
66 10007 FORMAT(49H LENGTH OF LONGITUDINAL MEMBERS ***** SIDE =F9.2)
67 10008 FORMAT(49H RADIUS OF SHELL ***** RADII =F9.2)
68 10009 FORMAT(49H ULTIMATE MOMENT (IN-KIPS/IN) ***** ULTM =F9.2)
69 20000 FORMAT(49H LARGER NODE NUMBER ON END OF MEMBER ** NUMBE = I5)
70 20001 FORMAT(49H SMALLER NODE NUMBER ON END OF MEMBER * NUMSE = I5)
71 20002 FORMAT(49H NUMBER OF NODES WITH SUPPORTS ***** NSUPN = I5)
72 20003 FORMAT(49H METHOD OF NUMBERING NODES ***** NCODE = I5)
73 20009 FORMAT(49H ULT. AXIAL STRESS (KIPS/SQ.IN/INCH) ** ULTSTR =F9.2)
74 READ 301,NUMPR
75 C NUMPR ** NUMBER OF PROBLEMS TO BE SOLVED IN THIS COMPUTER RUN
76 DO 999 JPROB=1,NUMPR
77 1 READ 301, NPROB,NCODE ,NBAYL,NBAYW,NLJAJ,NSUPN,NRK,MAVLE
78 C NPROB ** PROBLEM IDENTIFICATION NUMBER
79 C NUMBE ** NODE NUMBER ON BIG END OF MEMBER(FOR BAND WIDTH CALC)
80 C NUMSE ** NODE NUMBER ON SMALL END OF MEMBER(FOR BAND WIDTH CALC)
81 C NBAYL ** NUMBER OF BAYS ALONG SHELL AXIS
82 C NBAYW ** NUMBER OF BAYS ALONG ARCH
83 C NLJAJ ** NUMBER OF LOADS ON SHELL
84 C NSUPN ** NUMBER OF NODES WHICH HAVE SUPPORTS
85 C SENGTH ** LENGTH OF SHELL
86 READ 900,SPAN,HEIGHT,SENGTH
87 READ 300,THICKW,THICKH,ULTM,THICKA,ULTSTR,E,R
88 READ 900,COUT,CIN,RATMOD
89 READ 300,(PCENT(I),I=1,NRK)
90 MQ=NBAYW*NBAYL
91 IF (NBAYL-NBAYW)4,5,5
92 4 NUMBE = NBAYL+3
93 GO TO 6
94 5 NUMBE = NBAYW + 3
95 6 NUMSE = 1
96 NBAND=10*(NUMBE-NUMSE)+9
97 NBSYM=(NBAND+1)/2
98 NY=NBAYL*(4*NBAYW+1)+NBAYW
99 NODES=(NBAYW+1)*(NBAYL+1)
100 NOD5 = 5*NODES
101 SIDE=SENGTH/NBAYL
102 PI=3.14159265
103 BETA=PI/2.-2.* ATAN(HEIGHT/(SPAN/2.))
104 RADII=HEIGHT+SPAN*TAN(BETA)/2.
105 CA=PI-2.*BETA
106 CAD=CA*180./PI
107 DO 981 I=1,NOD5
108 981 NSP(I)=0
109 NSUPS=0
110 DO 890 I=1,NSJPN
111 READ 301,NODE,(NP(J),J=1,5)
112 DO 891 K=1,5
113 IF (NP(K)) 892,891,892
114 892 NCT=5*NODE-5+NP(K)
115 NSP(NCT)=1
116

```

```

126      NSUPS=NSUPS+1
127      NS(NSJPS)=NCT
128      891 CONTINUE
129      890 CONTINUE
130      IRK=1
131      NPRNT=0
132      LSUM=J
133      RN=(1.0+R)/R
134      DO 342 J=1,N0J5
135      X0(J)=0.0
136      Q(J)=0.0
137      342 CONTINUE
138      III=N4*2
139      DO 331 I=1,III
140      SUM(I)=0.0
141      SCM(I)=0.0
142      331 SCM2(I)=0.0
143      DO 235 MN=1,N4
144      235 AXIAL(MN)=0.0
145      DO 236 J=1,NLOAD
146      236 READ 901,I,Q(I)
147      PRINT 550
148      PRINT 420,NPROB
149      PRINT 421
150      PRINT 422
151      PRINT 551
152      PRINT 552
153      PRINT 424,NRK
154      PRINT 425,NM
155      PRINT 502,NODES
156      PRINT 503,NODE5
157      PRINT 504,NBAYL
158      PRINT 505,NBAYW
159      PRINT 426,NLOAD
160      PRINT 427,NSUPS
161      PRINT 20002,NSUPV
162      PRINT 428,NBAND
163      PRINT 20000,NJMSE
164      PRINT 20001,NJMSE
165      PRINT 20003,NCODE
166      PRINT 10005,NBSYM
167      PRINT 430,R
168      PRINT 495,THICKA
169      PRINT 494, THICKY
170      PRINT 10004,THICKW
171      PRINT 10009,ULTY
172      PRINT 20009,ULTSTR
173      PRINT 620,HEIGHT
174      PRINT 621,SPAN
175      PRINT 623,CAD
176      PRINT 10006,SENGTH
177      PRINT 10007,SIDE
178      PRINT 10008,RADII
179      PRINT 497,E
180      PRINT 362
181      PRINT 550
182      PRINT 440
183      C GENERATE SHELL COORDINATES
184      C ORIGIN ALONG CENTERLINE OF SHELL
185      NBAY1=NBAYW+1
186      AA=0.0
187      PI=3.14159265
188      C MANGLE = 1 **** ONE-HALF ARCH (90 DEGREES)
189      C MANGLE = 2 **** FULL ARCH (180 DEGREES)

```

```

190      GO TO (880,881),ANGLE
191      881 SEG = NBAYH
192      GO TO 882
193      880 SEG = NBAYH * 2
194      882 CONTINUE
195      DO 9 I=1,NBAY1
196      CRS(I)=COSF(AA*CA/SEG+BETA)*RADII
197      SRN(I)=SINF(AA*CA/SEG+BETA)*RADII
198      9 AA=AA+1.0
199      JCT=J
200      SB=0.0
201      NBAY2=NBAYL+1 NBAY3=NBAY1*NBAY2
202      C NCODE=0--NODES NUMBERED IN DIRECTION OF ARCH AXIS
203      C NCODE=1--NODES NUMBERED ALONG ARCH
204      IF (NCODE)16,17,16
205      16 CONTINUE
206      DO 11 I=1,NBAY2
207      DO 11 J=1,NBAY1
208      JCT=JCT+1
209      X(JCT)=-CRS(J)
210      Y(JCT)=SB*SIDE
211      Z(JCT)=SRN(J)-(RADII-HEIGHT)
212      18 CONTINUE
213      10 SB=SB+1.0
214      GO TO 112
215      17 CONTINUE
216      DO 110 I=1,NBAY1
217      SB=0.0
218      DO 111 J=1,NBAY2
219      JCT=JCT+1
220      X(JCT)=-CRS(I)
221      Y(JCT)=SB*SIDE
222      Z(JCT)=SRN(I)-(RADII-HEIGHT)
223      111 SB=SB+1.0
224      110 CONTINUE
225      112 CONTINUE
226      PRINT520
227      520 FORMAT(514 NOJE X COORDINATE Y COORDINATE Z COORDINATE/)
228      DO 11 N=1,NODES
229      11 PRINT 521,N,X(N),Y(N),Z(N)
230      521 FORMAT(I5,F11.3,2F16.3)
231      C OBTAINING MEMBER PROPERTIES AND GEOMETRY RELATIONSHIPS
232      SQT2=SQRT(2.0)
233      C AAA= LENGTH OF ELEMENTS ALONG ARCH
234      C BBB= LENGTH OF ELEMENTS ALONG SHELL AXIS
235      AAA=2.0*RADII*SINF(CA/(2.0*SEG))
236      BBB= LENGTH/NBAYL
237      DO 13 IJK=1,NM
238      READ 202,IN,JM,KM,MTYPE
239      XJ(MV)=X(JM)
240      YJ(MV)=Y(JM)
241      ZJ(MV)=Z(JM)
242      XK(MV)=X(KM)
243      YK(MV)=Y(KM)
244      ZK(MV)=Z(KM)
245      JEM(MV)=JM
246      KEM(MV)=KM
247      C MTYPE = 1 ***** INTERIOR MEMBER ALONG ARCH
248      C MTYPE = 2 ***** EXTERIOR MEMBER ALONG ARCH
249      C MTYPE = 3 ***** INTERIOR HORIZONTAL MEMBER
250      C MTYPE = 4 ***** EXTERIOR HORIZONTAL MEMBER
251      C MTYPE = 5 ***** DIAGONAL MEMBER
252      GO TO (250,260,270,280,290) MTYPE
253      250 SECMO= BBB*THICK4**3/12.

```



```

254      AREA(MN)=888*THICKA
255      PULT(MN)=888*THICKA*JLTSTR
256      PM(MN)=888*ULTM
257      GO TO 12
258  260  SECMO=.5*888*THICKM**3/12.
259      AREA(MN)=.5*888*THICKA
260      PULT(MN)=.5*888*THICKA*ULTSTR
261      PM(MN)=.5*888*ULTM
262      GO TO 12
263  270  SECMO=AAA*THICKW**3/12.
264      AREA(MN)=AAA*THICKA
265      PULT(MN)=AAA*THICKA*JLTSTR
266      PM(MN)=AAA*ULTM
267      GO TO 12
268  280  SECMO=.5*AAA*THICKW**3/12.
269      AREA(MN)=.5*AAA*THICKA
270      PULT(MN)=.5*AAA*THICKA*ULTSTR
271      PM(MN)=.5*AAA*ULTM
272      GO TO 12
273  290  SECMO=.01
274      AREA(MN)=.01
275      PULT(MN)=10.
276      PM(MN)=10.
277      12  CONTINUE
278  C  12  PRINT 442,MN,JM,KM,AREA(MN),PULT(MN),SECMO,PM(MN)
279      MTYPE(MN)=MTYPE
280      13  XIX(MN)=SECMO
281      PRINT 550
282      PRINT 510
283      PRINT 511,(NS(I),I=1,NSUPS)
284      PRINT 512
285      PRINT 516,(D(I),I=1,NOD5)
286      PRINT 517
287      PRINT 516,(PCENT(I),I=1,NRK)
288      DO 237 I=1,NOD5
289  237  Q(I)=D(I)
290  C  DETERMINE INDEXING MATRICES REQUIRED FOR BANDING
291      CALL 3AND (NOD5,NBAND,IX,JBLD,JBRD)
292      DO 400 M4MM=1,NRK
293      RUNG=5.0
294      FACT=0.0
295  200  CONTINUE
296      IJ=J
297      DO 330 I=1,NBSYM
298      DO 330 J=1,NOD5
299  330  S(I,J)=0.0
300      DO 549 J=1,NOD5
301  549  D(J)=Q(J)*PCENT(M4MM)
302      DO 14 MN=1,NM
303  C  GENERATE COMPATIBILITY MATRIX, B
304      CALL 6MPAT(XJ,YJ,ZJ,XK,YK,ZK,T,B,MN)
305  C  GENERATE ELEMENT STIFFNESS MATRIX, ES
306      CALL 6LENK(MN,XIX,T,E,SOM,PM,R,RN,ES,PULT,AXIAL,AREA)
307  C  MULTIPLY COMPATIBILITY MATRIX BY ES
308      CALL 4MULT(3,10,3,S8,ES,8)
309  C  DEVELOP STRUCTURE ORIENTED STIFFNESS MATRIX, ZK
310      CALL 4TRAV(10,10,3,T<,B,S3)
311      15  JMM=JEM(MN)
312      KMM=KEM(MN)
313  C  ASSEMBLE THE MASTER STIFFNESS MATRIX, S
314      CALL 2ACK (JMM,KMM,IX,TK,S)
315      14  CONTINUE
316  C  SOLVE FOR THE DISPLACEMENTS
317      CALL 6QSOL(NOD5,S,IX,JBLD,JBRD,NSP)

```

```

318      IF (NPRNT) 678,680,679
319      680 CONTINUE
320      888 PRINT 550
321      PRINT 441
322      DO 839 MN=1,NM
323      PRINT 442,MN,JEM(MN), KEY(MN),
324      1      AREA(MN),PULT(MN),XIX(MN),PM(MN),T(MN)
325      2,MMTYP(MN)
326      889 CONTINUE
327      PLOTN=0.
328      RK=1.0/PCENT(1)
329      CALL PRVT(NM,JEM,KEM,T,XJ,YJ,ZJ,XK,YK,ZK,XIX,E,RK,NOD5,D,
330      1      VPROB,AREA,MMTYP,CIN,SCOUT,RATMOD,Q,CONTROL)
331      NPRNT=VPRNT+1
332      678 CONTINUE
333      PLOTN=1.
334      IF (NR<) 683, 998, 683
335      683 CONTINUE
336      C      INTEGRATING THE INTERNAL MOMENTS
337      IJ=0
338      DO 42 MN=1,NM
339      J5=JEM(MN)*5
340      DD(1)=D(J5-4)
341      DD(2)=D(J5-3)
342      DD(3)=D(J5-2)
343      DD(4)=D(J5-1)
344      DD(5)=D(K5)
345      K5=KEY(MN)*5
346      DD(6)=D(K5-4)
347      DD(7)=D(K5-3)
348      DD(8)=D(K5-2)
349      DD(9)=D(K5-1)
350      DD(10)=D(K5)
351      CALL CHPAT(XJ,YJ,ZJ,XK,YK,ZK,T,B,MN)
352      XJ(MN)=XJ(MN)+DD(1)/RUNG
353      YJ(MN)=YJ(MN)+DD(2)/RUNG
354      ZJ(MN)=ZJ(MN)+DD(3)/RUNG
355      XK(MN)=XK(MN)+DD(6)/RUNG
356      YK(MN)=YK(MN)+DD(7)/RUNG
357      ZK(MN)=ZK(MN)+DD(8)/RUNG
358      CALL ELEMK(MN,XIX,T,E,SOM,PM,R,RN,ES ,PULT,AXIAL,AREA)
359      CALL MULT(3,10,3,SB,ES,B)
360      C      P = (SB) * D
361      CALL MULT(3,1,13,P,S3,DD)
362      AXIAL(MN)=AXIAL(MN)+P(1)/RUNG
363      DO 622 I=2,3
364      IJ=IJ+1
365      SUM(IJ)=SJH(IJ)+P(I)/RUNG
366      SOM(IJ)=SOM2(IJ)+P(I)*FACT
367      622 CONTINUE
368      42 CONTINUE
369      C      BEGIN RUNGE-KUTTA INTEGRATION
370      GO TO (700,701,702,703),IRK
371      700 DO 800 J=1,NOD5
372      800 X0(J)=X0(J)+D(J)/6.0
373      FACT=.50
374      RUNG=3.0
375      GO TO 100
376      701 DO 801 J=1,NOD5
377      801 X0(J)=X0(J)+D(J)/3.0
378      FACT=.50
379      RUNG=3.0
380      GO TO 100
381      702 DO 802 J=1,NOD5

```

```

382      802 X0(J)=X0(J)+D(J)/3.0
383          FACT=1.0
384          RUNG=6.0
385          GO TO 100
386      703 DO 803 J=1,N005
387      803 X0(J)=X0(J)+D(J)/6.0
388          RUNG=6.0
389      100 CONTINUE
390          IF(IRQ-4) 482,490,493
391      490 CONTINUE
392          PRINT 550
393          PRINT 420,NPROB
394          PRINT 362
395          PRINT 450,MMMMM
396          TSUM=PCENT(MMMM)*100.0
397          LSUM=LSUM+TSUM
398          PRINT 519,LSUM
399          PRINT 518,TSUM
400          PRINT 362
401          PRINT 454
402          PRINT 455
403          JRD=J
404          DO 671 JR=5,N005,5
405          JRD=JRD+1
406      671 PRINT 456,JRD,X0(JR-4),X0(JR-3),X0(JR-2),X0(JR-1),X0(JR)
407          PRINT 362
408          PRINT 362
409          PRINT 451
410          PRINT 452
411      491 IBD=J
412          NMT2=NM*2
413          DO 652 IA=1,NMT2,2
414          IBD=IBD+1
415          EYOMJ=SUM(IA)
416          EYOMK=SUM(IA+1)
417          SHEAR=(EYOMK-EYOMJ)/T(IBD)
418          PPPJ=EYOMJ/PY(IBD)
419          PPPK=EYOMK/PY(IBD)
420          PAX=AXIAL(IBD)/PLT(IBD)
421      652 PRINT 453,IBD,EYOMJ,EYOMK,SHEAR,AXIAL(IBD),PH(IBD),PPPJ,PPPK,PAX
422      482 CONTINUE
423          IRQ=IRQ+1
424          IF(IRQ-5) 200,99,99
425      99 IRQ=1
426          DO632 I=1,NMT2
427          SOM(I)=SUM(I)
428      632 SOM2(I)=SJM(I)
429      399 CONTINUE
430      400 CONTINUE
431          PRINT 900,CONTROL
432          PRINT 30000,(X0(I),I=1,N005)
433      30000 FORMAT(5(E13.5,5X))
434          IF(CONTROL.EQ.0.)GO TO 998
435      30001 IF(UNIT,7) 30001,850,30002,30003
436      30002 PRINT 805
437      30003 PRINT 804
438          804 FORMAT(*PARITY*)
439          805 FORMAT(*EOF*)
440          850 BUFFEROUT(7,1)(X0(1),X0(N005))
441      21000 IF(UNIT,7) 21000,851,851,851
442          851 CONTINUE
443          END FILE 7
444      998 CONTINUE
445          PRINT 550

```

```

446 999 CONTINUE
447 END
448 SUBROUTINE EQSOL(M2,SS,P,IX,JL,JR,NSP)
449 DIMENSION SS(65,1155),P(1155),IX(1155),JL(1155),JR(1155),NSP(1155)
450 NNODES=M2*5
451 DO 420 II=1,NNODES
452 IF(NSP(II)) 420,425,420
453 425 K8 = IX(II)
454 K8 = 1.0/SS(K8,II)
455 JRT= JR(II)
456 DO 434 JJ = II,JRT
457 434 SS(K8,JJ)=SS(K8,JJ)*K8
458 P(II)=P(II)*K8
459 DO 424 LL=1,JRT
460 LB = IX(LL)
461 IF(LB-II) 424,424,429
462 428 IF(NSP(LL)) 424,421,424
463 421 98 = SS(K8,LL)/K8
464 IF(98) 423,424,423
465 423 DO 422 JJ=LL,JRT
466 422 SS(LB,JJ)=SS(LB,JJ)-SS(K8,JJ)*98
467 P(LL)=P(LL)-P(II)*98
468 424 CONTINUE
469 420 CONTINUE
470 DO 452 II=2,NNODES
471 JJ=NNODES+1-II
472 IF(NSP(JJ)) 451,451,452
473 451 JB=IX(JJ)
474 K8=II-1
475 LL=JL(II)
476 DO 450 MM=LL,KK
477 NV = NNODES + 1 - MM
478 P(JJ)=P(JJ)-SS(JB,NV)*P(NV)
479 452 CONTINUE
480 RETURN
481 END
482 SUBROUTINE PACK(JM,K4,IX,ZK,SS)
483 DIMENSION IX(1155),ZK(10,10),SS(65,1155)
484 IP3=J4*5
485 IQ3=K4*5
486 DO 380 IROW=1,5
487 JROW=5-IROW
488 IIP3=IP3-JROW
489 IIQ3=IQ3-JROW
490 KROW=IX(IIP3)
491 LROW=IX(IIQ3)
492 DO 381 ICOL=1,5
493 JCOL=5-ICOL
494 KCOL=IP3-JCOL
495 LCOL=IQ3-JCOL
496 IF(IP3-IQ3) 315,315,314
497 315 SS(KROW,LCOL)=SS(KROW,LCOL)+ZK(IROW,ICOL+5)
498 314 IF(IP3-IQ3) 319,307,307
499 307 SS(LROW,KCOL)=SS(LROW,KCOL)+ZK(IROW+5,ICOL)
500 319 CONTINUE
501 381 CONTINUE
502 DO 382 ICOL=IROW,5
503 JCOL=5-ICOL
504 KCOL=IP3-JCOL
505 LCOL=IQ3-JCOL
506 SS(KROW,KCOL)=SS(KROW,KCOL)+ZK(IROW,ICOL)
507 SS(LROW,LCOL)=SS(LROW,LCOL)+ZK(IROW+5,ICOL+5)
508 382 CONTINUE
509 380 CONTINUE

```

```

510      RETURN
511      END
512      SUBROUTINE BAND(M,NBAND,IX,JL,JR)
513      DIMENSION IX(1155),JL(1155),JR(1155)
514      NODES=5*M1
515      NBSYM = (NBAND + 1)/2
516      KOUNT = 1
517      DO 373 II=1,NODES
518      IF(II-KOUNT * NBSYM) 371,371,372
519      371 IX(II)=II -NBSYM * (KOUNT -1)
520      GO TO 370
521      372 IX(II)=II-NBSYM * KOUNT
522      KOUNT = KOUNT + 1
523      373 CONTINUE
524      JRT =(NBAND -1)/2
525      JS =NODES - JRT
526      IS =JRT + 1
527      DO 340 II=1,NODES
528      IF(II-IS) 350,350,352
529      350 JLT = 1
530      JRT = JRT + 1
531      GO TO 356
532      352 IF(II-JS) 351,353,353
533      351 JLT = JLT + 1
534      JRT = JRT + 1
535      GO TO 356
536      353 JLT = JLT + 1
537      JRT = NODES
538      356 JL(II) = JLT
539      JR(II) = JRT
540      340 CONTINUE
541      RETURN
542      END
543      SUBROUTINE MULT(L,M,N,RESULT,AA,BB)
544      DIMENSION RESULT(10,10),AA(10,10),BB(10,10)
545      C      RESULT = AA * BB      AA IS L X N      BB IS N X M
546      DO 100 I=1,L
547      DO 100 J=1,M
548      RESULT(I,J)=0.0
549      DO 100 K=1,N
550      100 RESULT(I,J)=RESULT(I,J)+AA(I,K)*BB(K,J)
551      RETURN
552      END
553      SUBROUTINE MTRAN(L,M,N,RESULT,AA,BB)
554      DIMENSION RESULT(10,10),AA(10,10),BB(10,10)
555      C      RESULT=(AA)T * BB      AA IS N X L      BB IS L X M
556      DO 100 I=1,L
557      DO 100 J=1,M
558      RESULT(I,J)=0.0
559      DO 100 K=1,N
560      100 RESULT(I,J)=RESULT(I,J)+AA(K,I)*BB(K,J)
561      RETURN
562      END
563      SUBROUTINE CMPT(XJ,YJ,ZJ,XK,YK,ZK,T,B,MN)
564      DIMENSION B(10,10),XJ(830),YJ(830),ZJ(830),XK(830),
565      2      YK(830),ZK(830),T(830)
566      DO 10 I=1,3
567      DO 10 J=1,10
568      10 B(I,J)=0.0
569      XX=XK(MN)-XJ(MN)
570      YY=YK(MN)-YJ(MN)
571      ZZ=ZK(MN)-ZJ(MN)
572      T(MN)=SQRTF(XX*XX+YY*YY+ZZ*ZZ)
573      XY = SQRTF(XX*XX+YY*YY)

```

```

574      CA = XX/XY
575      SA = YY/XY
576      CB = XY/T(MN)
577      SB = ZZ/T(MN)
578      B(1,1) = CA*CB
579      B(1,2) = SA*CB
580      B(1,3) = SB
581      B(1,5) = -B(1,1)
582      B(1,7) = -B(1,2)
583      B(1,8) = -B(1,3)
584      B(2,1) = CA*SB/T(MN)
585      B(2,2) = SA*SB/T(MN)
586      B(2,3) = -CB/T(MN)
587      B(2,4) = -SA
588      B(2,5) = CA
589      B(2,6) = -B(2,1)
590      B(2,7) = -B(2,2)
591      B(2,8) = -B(2,3)
592      B(3,1) = -B(2,1)
593      B(3,2) = -B(2,2)
594      B(3,3) = -B(2,3)
595      B(3,5) = -B(2,6)
596      B(3,7) = -B(2,7)
597      B(3,8) = -B(2,8)
598      B(3,9) = -B(2,4)
599      B(3,10) = -B(2,5)
600      RETURN
601      END
602      SUBROUTINE ELEMK(MN,SECNO,T,E,SUM,PM,R,RN,ES,PJLT,AXIAL,AREA)
603      DIMENSION SECNO(830),T(830),PM(830),SUM(1660),ES(10,10)
604      ,AREA(830),PULT(830),AXIAL(830)
605      JZ=MV*2-1
606      AA=ABSF(AXIAL(MN)/PULT(MN))
607      IF(AA-1.0) 50,60,60
608      60 AA=5.0*AA
609      50 CONTINUE
610      PPIJ=ABSF(SUM(JZ)/PM(MN))
611      PPJI=ABSF(SUM(JZ+1)/PM(MN))
612      IF(PPIJ-1.0) 10,10,20
613      20 PPIJ=.99999
614      10 IF(PPJI-1.0) 30,30,40
615      40 PPJI=.99999
616      30 ES(1,1)=(AREA(MN)*E/(PM(MN)))/(1.0+AA**R)**RN
617      ES(1,2)=0.0
618      ES(1,3)=0.0
619      ES(2,1)=0.0
620      ES(3,1)=0.0
621      AI=(1.0-PPIJ**R)**RN
622      AJ=(1.0-PPJI**R)**RN
623      PROD=(5.0*E*SECNO(MN)/T(MN))/(4.0-AI*AJ)
624      ES(2,2)=PROD*2.0*AI
625      ES(2,3)=-PROD*AI*AJ
626      ES(3,2)=ES(2,3)
627      ES(3,3)=PROD*2.0*AJ
628      RETURN
629      END
630      SUBROUTINE PRNT(MN,JEM,KEY,T,XJ,YJ,ZJ,XK,YK,ZK,XIX,E,RK,NOD5,D,
631      1NPROB,AREA,MTYPE,CIN,COU,RATMOD,Q,CONTROL)
632      DIMENSION Q(1)
633      C ONE INPUT CARD IS REQUIRED IN SUBROUTINE PRNT-
634      C CONTROL
635      DIMENSION JEM(830),KEY(830),T(830),
636      2 XIX(830),B(10,10),ES(10,10),SB(10,10),DJ(10),
637      3 P(10),J(1155),XJ(830),YJ(830),ZJ(830),XC(830),YK(830),

```

```

538      4      ZK(830), AREA(830)
539      *,MTYPE(830)
540      COMMON /2/ X(231), Z(231), PLOTAX(220),
541      1PLOT4J(220), PLOT4K(220), STRSOJ(220), STRSIJ(220), STRSOK(220),
542      2STRSIK(220), YANGLE
543      COMMON/3/ NBAYL, NBAYW
544      COMMON/4/ PLOTN
545      COMMON/5/ CA, JPR39, NU4PR
546      DIMENSION A(13)
547      399 FORMAT( 8X, 2H4N, 14X, 6HSTRSOJ, 14X, 6HSTRSOK, 14X, 5HSTRSIJ,
548      114X, 5HSTRSIK, //)
549      400 FORMAT(110, 4E20.5 )
550      420 FORMAT(20X14HPROBLEM NUMBER 14/)
551      452 FORMAT(991 MEMBER NO.      MOM. AT J END      MOM. AT < END      SHEAR
552      2      AXIAL
553      453 FORMAT(17, 1P4E17.5)
554      362      FORMAT(1H0)
555      461 FORMAT(42H THESE ARE THE ELASTIC NODAL DISPLACEMENTS/)
556      550 FORMAT(1H1)
557      460 FORMAT(10X29H THESE ARE THE ELASTIC FORCES//)
558      455 FORMAT(16, 1E17.5, 5E15.5)
559      455 FORMAT(12)H NODE      DELTA X      DELTA Y      DELTA Z
560      1      THETA X      THETA Y      THETA Z      )
561      PRINT 550
562      PRINT 420, NPROB
563      PRINT 461
564      PRINT 455
565      JRD=3
566      I=0
567      DO 671 JR=5, NOD5, 5
568      JRD=JRD+1
569      I=I+1
570      XX1=(JR-4)*RK
571      YY1=(JR-3)*RK
572      ZZ1=(JR-2)*RK
573      XX=D(JR-1)*RK
574      YY=D(JR)*RK
575      571 PRINT 455, JRD, XX1, YY1, ZZ1, XX, YY
576      NBAY3=NOD5/5
577      PRINT 362
578      PRINT 362
579      PRINT 460
580      PRINT 452
581      JERK=3
582      DO 41 MN=1, NM
583      J6=JE4(MN)*5
584      DD(1)=D(J6-4)
585      DD(2)=D(J6-3)
586      DD(3)=D(J6-2)
587      DD(4)=D(J6-1)
588      DD(5)=D(J6)
589      K6=KE4(MN)*5
590      DD(6)=D(K6-4)
591      DD(7)=D(K6-3)
592      DD(8)=D(K6-2)
593      DD(9)=D(K6-1)
594      DD(10)=D(K6)
595      CALL COMPAT(XJ, YJ, ZJ, XK, YK, ZK, T, R, MN)
596      ES(1,1)=AREA(MN)*E/T(MN)
597      ES(1,2)=0.0
598      ES(1,3)=0.0
599      ES(2,1)=0.0
700      ES(3,1)=0.0
701      ES(2,2)=4.0*E*XIX(MN)/T(MN)

```

```

732     ES(2,3)= -ES(2,2)/2.3
733     ES(3,2)=ES(2,3)
734     ES(3,3)=ES(2,2)
735     CALL MULT(3,10,3,SB,ES,B)
736 C     P = (SB) * D
737     CALL MULT(3,1,13,P,SB,DD)
738     AXIAL=P(1)*RK
739     XXX=P(2)*RK
740     YYY=P(3)*RK
741     IF (4TYPE(MN)-2) 10,13,20
742 10    JERK=JERK+1
743     PLOTAX(JERK)=AXIAL
744     PLOTMJ(JERK)=XXX
745     PLOTMK(JERK)=YYY
746     AA=AXIAL / AREA(MN)
747     STRSOJ(JERK)=AA+XXX*3OUT/XIX(MN)
748     STRSIJ(JERK)=AA-XXX*3IN/(XIX(MN)*RATMOD)
749     STRSOK(JERK)=AA+YYY*3OUT/XIX(MN)
750     STRSIK(JERK)=AA-YYY*3IN/(XIX(MN)*RATMOD)
751 20    CONTINUE
752     SHEAR=(YYY-XXX)/T(MN)
753     PRINT 453,MN,XXX,YYY,SHEAR,AXIAL
754 41    CONTINUE
755     PRINT 550
756     PRINT 399
757     J=0
758     DO 43 MN=1,NM
759     IF (4TYPE(MN)-2) 50,53,40
760 50    J=J+1
761     PRINT 400,MN,STRSOJ(J),STRSOK(J),STRSIJ(J),STRSIK(J)
762 40    CONTINUE
763 C     THIS PART OF THE SUBROUTINE CONTROLS THE ENTRY OR NON-ENTRY INTO THE
764 C     PLOTTING ROUTINES.
765 C     IF CONTROL EQUALS ZERO NO PLOTS WILL BE GENERATED. CONTROL IS READ IN AN
766 C     F10.3 FORMAT.
767     READ 500,CONTROL
768 530    FORMAT(F10.3)
769     IF (CONTROL.EQ.0.) GO TO 42
770     A(1)=3A
771     A(2)=JERK
772     A(3)=VBAYL
773     A(4)=VBAYW
774     A(5)=NUMPR
775     A(6)=VPROB
776     A(7)=RK
777     A(8)=4ANGLE
778     A(9)=JPROB
779     A(10)=PLOTN
780     NNODES=NNODES/5
781     A(11)=NNODES
782     A(12)=NNODES
783     I(13)=NM
784     DO 700 I=1,13
785     PRINT 701,I,A(I)
786 701    FORMAT(5X,3HI =,I5,5X,6HA(I) =,F10.4)
787 700    CONTINUE
788     PRINT 704
789     DO 732 I=1,JERK
790     PRINT 703,I,STRSOJ(I),STRSIJ(I),STRSOK(I),STRSIK(I),PLOTMJ(I),
791     1PLOTMK(I),PLOTAX(I)
792 704    FORMAT(7X,1HI,13X,5H3J(I),10X,5HIJ(I),10X,5HOK(I),10X,5HIK(I),
793     110X,5H4J(I),10X,5HMK(I),10X,5HAX(I))
794 703    FORMAT(5X,I5,7(5X,F10.4))
795 702    CONTINUE

```



```

756          PRINT 706
767          DO 705 I=1,NOD5
758          PRINT 707,I,Q(I),D(I)
769          706 FORMAT(5X,3H I ,10X,4HQ(I),10X,4HD(I))
770          707 FORMAT(5X,I5,10X,F10.4,10X,F10.4)
771          705 CONTINUE
772          PRINT 709
773          DO 708 I=1,NODES
774          PRINT 710,I,X(I),Z(I)
775          709 FORMAT(5X,3H I ,10X,4HX(I),10X,4HZ(I))
776          710 FORMAT(5X,I5,10X,F10.4,10X,F10.4)
777          708 CONTINUE
778          817 IF (UNIT,7) 817,818,819,820
779          820 PRINT 804
780          818 BUFFEROUT(7,1) (A(1),4(13))
781          819 CONTINUE
782          800 IF (UNIT,7) 800,801,802,803
783          803 PRINT 804
784          801 BUFFEROUT(7,1) (STRSOJ(1),STRSOJ(JERK))
785          804 FORMAT(*PARITY ERROR*)
786          802 CONTINUE
787          805 IF (UNIT,7) 805,806,807,808
788          808 PRINT 804
789          806 BUFFEROUT(7,1) (STRSIJ(1),STRSIJ(JERK))
790          807 CONTINUE
791          809 IF (UNIT,7) 809,810,811,812
792          812 PRINT 804
793          810 BUFFEROUT(7,1) (STRSOK(1),STRSOK(JERK))
794          811 CONTINUE
795          813 IF (UNIT,7) 813,814,815,816
796          816 PRINT 804
797          814 BUFFEROUT(7,1) (STRSIK(1),STRSIK(JERK))
798          815 CONTINUE
799          821 IF (UNIT,7) 821,822,823,824
800          824 PRINT 804
801          822 BUFFEROUT(7,1) (PLOTMJ(1),PLOTMJ(JERK))
802          823 CONTINUE
803          825 IF (UNIT,7) 825,826,827,828
804          828 PRINT 804
805          826 BUFFEROUT(7,1) (PLOTMK(1),PLOTMK(JERK))
806          827 CONTINUE
807          829 IF (UNIT,7) 829,830,831,832
808          832 PRINT 804
809          830 BUFFEROUT(7,1) (PLOTAX(1),PLOTAX(JERK))
810          831 CONTINUE
811          833 IF (UNIT,7) 833,834,835,836
812          836 PRINT 804
813          834 BUFFEROUT(7,1) (Q(1),2(NOD5))
814          835 CONTINUE
815          837 IF (UNIT,7) 837,838,839,840
816          840 PRINT 804
817          838 BUFFEROUT(7,1) (X(1),X(NODES))
818          839 CONTINUE
819          841 IF (UNIT,7) 841,842,843,844
820          844 PRINT 804
821          842 BUFFEROUT(7,1) (Z(1),Z(NODES))
822          843 CONTINUE
823          845 IF (UNIT,7) 845,846,847,848
824          848 PRINT 804
825          846 BUFFEROUT(7,1) (D(1),D(NOD5))
826          900 IF (UNIT,7) 900,847,847,847
827          847 CONTINUE
828          42 CONTINUE
830          END

```

3. COMPUTER PROGRAM SAN1PLT

```

1      PROGRAM SAN1PLT(INPUT,OUTPUT,TAPE7,TAPE5,FILMPL)
2      CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
3      CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
4      C   THE INPUTS TO THIS ROUTINE ARE THE TAPE 7 FROM SAN1 AND THE
5      C   FOLLOWING CARDS
6      C   (1)PLOTCON-SIGNALS LAST SET OF PLOTS WHEN EQUAL TO 0(F10.0)
7      C   (2) L-DETERMINES TYPE OF LOADS(I10)
8      C   L=1---X DIRECTION
9      C   L=2---Y DIRECTION
10     C   L=3---Z DIRECTION
11     C   L=4---THETA X DIRECTION
12     C   L=5---THETA Y DIRECTION
13     C   (3)NUMX--NUMBER OF NODES FOR CENTER ARCH
14     C   NUMZ--NUMBER OF NODES FOR CROWN DEFLECTIONS(2I10)
15     C   (4) NOD---NODE NUMBERS FOR CENTER ARCH(NUMX OF THEM)(I10)(LINEAR SOLUTION)
16     C   (5) NOD--NODE NUMBERS FOR CROWN DEFLECTIONS (NUMZ OF THEM) (I10)
17     C   (6)NOD--NODE NUMBERS FOR CENTER ARCH(NUMX OF THEM)(I10)(NONLINEAR SOLUTION)
18     C   (7)SF--SCALE FACTOR FOR INSIDE AND OUTSIDE STRESSES(F10.4)
19     C   A SET OF THE ABOVE ARE NECESSARY FOR EACH SET OF PLOTS
20     C   THE LAST DATA CARD SHOULD BE BLANK TO SIGNAL THE END OF THE PLOTS
21     CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
22     CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
23     COMMON/1/A(1000),B(1000),C(1000),D(1000),E(13),
24     1      F(1000),G(1000),
25     2      H(220),O(220),P(220),S(231),U(231),V(1155),W(1155)
26     COMMON/2/STRSOJ(1000),STRSIJ(1000),STRSOK(1000),STRSIK(1000),
27     1      PLOTHJ(220),PLOTHK(220),PLOTAX(220),X(231),Z(231),
28     2      D1(1155),X0(1155),Q(1155)
29     COMMON/3/CA,JERK,NBAYL,NBAYW,NUMPR,NPROB,MANGLE,JPROB
30     CALL PLOTS(100.,DUM,5)
31     CALL PHODE(3)
32     CALL RCTATE(270.)
33     CALL MAP(-1.,11.,-1.,11.,0.,1.,0.,1.)
34     C   A(1)-A(1000)=STRSOJ
35     C   B(1)-B(1000)=STRSIJ
36     C   C(1)-C(1000)=STRSOK
37     C   D(1)-D(1000)=STRSIK
38     C   E(1)=CA E(2)=JERK E(3)=NBAYL E(4)=NBAYW E(5)=NUMPR E(6)=NPROB
39     C   E(7)=RK E(8)=MANGLE E(9)=JPROB E(10)=PLOTN
40     C   E(11)=NOD5 E(12)=NODES E(13)=NM
41     C   H(1)-H(220)=PLOTHJ
42     C   O(1)-O(220)=PLOTHK
43     C   P(1)-P(220)=PLOTAX
44     C   Q(1)-Q(1155)=Q
45     C   S(1)-S(231)=X
46     C   U(1)-U(231)=Z
47     C   V(1)-V(1155)=D1
48     C   W(1)-W(1155)=X0
49     4  FORMAT(8F10.4)
50     3  READ 2,PLOTCON
51     2  FORMAT(F10.0)
52     IF(PLOTCON.EQ.0.) GO TO 16
53     817 IF(UNIT,7)817,818,819,820
54     820 PRINT 804
55     818 BUFFERIN(7,1)(E(1),E(13))
56     910 IF(UNIT,7)910,819,819,819
57     819 CONTINUE
58     CA=E(1) $ JERK=E(2) $ NBAYL=E(3) $ NBAYW=E(4) $ NUMPR=E(5)
59     NPROB=E(6) $ RK=E(7) $ MANGLE=E(8) $ JPROB=E(9) $ PLOTN=E(10)
60     NOD5=E(11) $ NODES=E(12) $ NM=E(13)
61     800 IF (UNIT,7)800,801,802,803

```

```

62      803 PRINT 804
63      801 BUFFERIN(7,1) (A(1),A(JERK))
64      804 FORMAT(*PARITY ERROR*)
65      802 CONTINUE
66      805 IF(UNIT,7) 805,806,807,808
67      808 PRINT 804
68      806 BUFFERIN(7,1) (B(1),B(JERK))
69      807 CONTINUE
70      809 IF(UNIT,7) 809,810,811,812
71      812 PRINT 804
72      810 BUFFERIN(7,1) (C(1),C(JERK))
73      811 CONTINUE
74      813 IF(UNIT,7) 813,814,815,816
75      816 PRINT 804
76      814 BUFFERIN(7,1) (C(1),D(JERK))
77      815 CONTINUE
78      821 IF(UNIT,7) 821,822,823,824
79      824 PRINT 804
80      822 BUFFERIN(7,1) (F(1),H(JERK))
81      823 CONTINUE
82      825 IF(UNIT,7) 825,826,827,828
83      828 PRINT 804
84      826 BUFFERIN(7,1) (O(1),O(JERK))
85      827 CONTINUE
86      829 IF(UNIT,7) 829,830,831,832
87      832 PRINT 804
88      830 BUFFERIN(7,1) (F(1),P(JERK))
89      831 CONTINUE
90      833 IF(UNIT,7) 833,834,835,836
91      836 PRINT 804
92      834 BUFFERIN(7,1) (G(1),Q(NOD5))
93      835 CONTINUE
94      837 IF(UNIT,7) 837,838,839,840
95      840 PRINT 804
96      838 BUFFERIN(7,1) (S(1),S(NODES))
97      839 CONTINUE
98      841 IF(UNIT,7) 841,842,843,844
99      844 PRINT 804
100     842 BUFFERIN(7,1) (L(1),U(NODES))
101     843 CONTINUE
102     845 IF(UNIT,7) 845,846,847,848
103     848 PRINT 804
104     846 BUFFERIN(7,1) (V(1),V(NOD5))
105     847 CONTINUE
106     849 IF(UNIT,7) 849,850,851,852
107     852 PRINT 804
108     850 BUFFERIN(7,1) (W(1),W(NOD5))
109     900 IF(UNIT,7) 900,851,851,851
110     851 CONTINUE
111         UC 10 I=1,NOD5
112         STRSOJ(I)=A(I)
113         STRSIJ(I)=B(I)
114         STRSOK(I)=C(I)
115         STRSIK(I)=D(I)
116     10 CONTINUE
117         DO 11 I=1,JERK
118         PLOTMJ(I)=H(I)
119         PLOTMK(I)=O(I)
120         PLOTAX(I)=P(I)
121     11 CONTINUE
122         DC 12 I=1,NOD5
123         Q(I)=Q(I)
124         D1(I)=V(I)
125         X0(I)=W(I)

```

```

126      12 CONTINUE
127      DO 13 I=1,NODES
128          X(I)=S(I)
129          Z(I)=U(I)
130      13 CONTINUE
131      DO 700 I=1,13
132          PRINT 701,I,E(I)
133      701 FORMAT(5X,3H I =,15,5X,6H E(I) =,F10.4)
134      700 CONTINUE
135          PRINT 704
136          DO 702 I=1,JERK
137              PRINT 703,I,STRSOJ(I),STRSIJ(I),STRSOK(I),STRSIK(I),PLOTMJ(I),
138                  1PLOTMK(I),PLOTAX(I)
139      704 FORMAT(7X,1H I,10X,5H OJ(I),10X,5HIJ(I),10X,5HCK(I),10X,5HIK(I),
140                  110X,5H MJ(I),10X,5HMK(I),10X,5HAX(I))
141      703 FORMAT(5X,I5,7(5X,F10.4))
142      702 CONTINUE
143          PRINT 706
144          DO 705 I=1,NOD5
145              PRINT 707,I,Q(I),O1(I),XO(I)
146      706 FORMAT(5X,3H I,10X,4HQ(I),10X,4HO(I),10X,5HXO(I))
147      707 FORMAT(5X,I5,10X,F10.4,10X,F10.4,10X,F10.4)
148      705 CONTINUE
149          PRINT 709
150          DO 708 I=1,NODES
151              PRINT 710,I,X(I),Z(I)
152      709 FORMAT(5X,3H I,10X,4HX(I),10X,4HZ(I))
153      710 FORMAT(5X,I5,10X,F10.4,10X,F10.4)
154      708 CONTINUE
155          CALL TLOP(RK)
156      CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
157      CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
158      C      IB-CONTROL CRCHN DEFLECTIONS AND CENTER ARCH PLOTS
159      C      IB=0-BOTH PLOTS
160      C      IB=1-CENTER ARCH ONLY
161      C      PLOTN-CONTROLS LABELS FOR CENTER ARCH PLOTS
162      C      PLOTN=0.-LINEAR SOLUTION
163      C      PLOTN=1.-NON-LINEAR SOLUTION
164      CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
165      CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
166          PLOTN=0.
167          IB=0
168          CALL ARCHPLT(RK,X,Z,O1,HANGLE,PLOTN,IB)
169          PLOTN=1.
170          IB=1
171          CALL ARCHPLT(1.,X,Z,XJ,HANGLE,PLOTN,IB)
172          CALL STRESSP
173          GO TO 3
174      16 CALL PLOT(0.,0.,40)
175          END
176          SUBROUTINE TLOP(RK)
177              COMMON/2/STRSOJ(1000),STRSIJ(1000),STRSOK(1000),STRSIK(1000),
178                  1 PLOTMJ(220),PLOTMK(220),PLOTAX(220),X(231),Z(231),
179                  2 O1(1155),XU(1155),Q(1155)
180              COMMON/3/CA,JERK,NBAYL,NBAYW,NUMPR,NPROB,HANGLE,JPRCB
181              CALL SLADR(ONEL,ONEM,XL,YW,NBL,NBW)
182              IF(NBAYW.GT.NBAYL) GO TO 1
183              NBAYLI=NBAYL
184              NBAYWI=NBAYW
185              GO TO 5000
186      1 NBAYLI=NBAYW $NBAYWI=NBAYL
187              GO TO 5000
188      CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
189      CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

```

```

190 C      PLOT NUMBER 2
191 C      MOMENTS AT J-END AND K-END
192 CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
193 CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
194 5000 XA=0.0
195      CALL PLOT(0.,0.,3)
196      CALL PLOT(0.,0.,2)
197      DO 10 I=1,NBAYLI
198      CALL PLOT(XA+0.,YH,1)
199      CALL PLOT(XA+ONEL,YH,1)
200      CALL PLOT(XA+ONEL,0.,1)
201      CALL PLOT(XA,0.,1)
202      CALL PLOT(XA+ONEL,0.,3)
203      CALL PLOT(XA+ONEL,0.,2)
204      XA=XA+CNEL
205 10 CONTINUE
206      YA=0.
207      LI=NBAYHI/2.
208      DO 11 J=1,LI
209      CALL PLOT(0.,YA,3)
210      CALL PLOT(0.,YA+ONEW,3)
211      CALL PLOT(0.,YA+ONEW,2)
212      CALL PLOT(XL,YA+ONEW,1)
213      CALL PLOT(XL,YA+2*ONEW,3)
214      CALL PLOT(XL,YA+2*ONEW,2)
215      CALL PLOT(0.,YA+2*ONEW,1)
216      YA=YA+2*ONEW
217 11 CONTINUE
218      XA=XL 3YA=0. 3L=1
219 C      PLOT NUMBER TWO.
220 C      DEFINING MOMENTS AT J-END AND K-END OF ELEMENTS.
221      DO 110 I=1,NBL
222      DO 100 K=1,NBAYHI
223 C      PLOTMJ = MOMENT AT JEND OF ELEMENT
224 C      PLOTMK = MOMENT AT KEND OF ELEMENT
225      CALL NUMBER(XA-.28,YA+(.1*ONEW),.12,PLOTMJ(L),0.,4HF8.2)
226      CALL NUMBER(XA-.28,YA+(.8*ONEW),.12,PLOTMK(L),0.,4HF8.2)
227      L=L+1
228 100 YA=YA+ONEW
229      YA=0.
230      XA=XA+CNEL
231 110 CONTINUE
232      XPOS=(XL/2.)-1.
233      CALL PLOT(XPOS,-.35,3)
234      CALL PLGT(XPOS,-.35,2)
235      CALL SYMBOL(XPOS,-.35,.12,21HMOMENTS ( INCH-KIPS ),0.,21)
236      CALL SYMBOL(XPOS+.5,-.50,.10,7HPROBLEM,0.,7)
237      CALL NUMBER(XPOS+1.25,-.50,.10,NPROB,0.,2HI5)
238      CALL PLOT(XL+5.,0.,-3)
239      GO TO 600
240 500 XA=0.
241      YA=0.
242      L=1
243      DO 121 I=1,NBAYLI
244      DO 111 K=1,NBW
245      CALL NUMBER(XA+(.15*ONEL),YA-(.2*ONEW),.12,PLOTMJ(L),90.,4HF8.2)
246      CALL NUMBER(XA+(.85*ONEL),YA-(.2*ONEW),.12,PLOTMK(L),90.,4HF8.2)
247      L=L+1
248 111 YA=YA+ONEW
249      YA=0.
250      XA=XA+CNEL
251 121 CONTINUE
252      XPOS=(XL/2.)-1.
253      CALL PLCT(XPOS,-.35,3)

```

```

254      CALL PLOT(XPOS,-.35,2)
255      CALL SYMBOL(XPCS,-.35,.12,21HMOMENTS ( INCH-KIPS ),0.,21)
256      CALL SYMBOL(XPOS+.5,-.50,.10,7HPROBLEM,0.,7)
257      CALLNUMBER(XPOS+1.25,-.50,.10,NPROB,0.,2HI5)
258      CALL PLOT(XL+5.,0.,-3)
259      CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
260      CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
261      C      PLOT NUMBER 3
262      C      AXIAL STRESSES
263      CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
264      CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
265      600  XA=0.0
266          CALL PLOT(0.,0.,3)
267          CALL PLOT(0.,0.,2)
268          DO 12 I=1,NBAYLI
269              CALL PLOT(XA+0.,YH,1)
270              CALL PLOT(XA+ONEL,YH,1)
271              CALL PLOT(XA+ONEL,0.,1)
272              CALL PLOT(XA,0.,1)
273              CALL PLOT(XA+ONEL,0.,3)
274              CALL PLOT(XA+ONEL,0.,2)
275              XA=XA+CNEL
276      12  CONTINUE
277          YA=0.
278          LI=NBAYLI/2.
279          DO 13 J=1,LI
280              CALL PLOT(0.,YA,3)
281              CALL PLOT(0.,YA+ONEH,3)
282              CALL PLOT(0.,YA+ONEH,2)
283              CALL PLOT(XL,YA+ONEH,1)
284              CALL PLOT(XL,YA+2*ONEH,3)
285              CALL PLOT(XL,YA+2*ONEH,2)
286              CALL PLOT(0.,YA+2*ONEH,1)
287              YA=YA+2*ONEH
288      13  CONTINUE
289      C      CHECK FOR FULL OR HALF ARCH.
290          IF(MANGLE.EQ.2) GO TO 700
291          XA=XL  YA=0.  SL=1
292      C      PLOT NUMBER THREE.
293      C      DEFINING AXIAL FORCE FOR EACH ELEMENT.
294          DO 210 I=1,NBL
295              DO 200 K=1,NBAYLI
296              C      PLOTAX = AXIAL FORCE
297                  CALL NUMBER(XA-.28,YA+(.5*ONEH),.12,PLOTAX(L),0.,4HF5.2)
298                  L=L+1
299      200.  YA=YA+ONEH
300          YA=0.
301          XA=XA-CNEL
302      210  CONTINUE
303          XPOS=(XL/2.)-1.
304          CALL PLOT(XPOS,-.35,3)
305          CALL PLOT(XPOS,-.35,2)
306          CALL SYMBOL(XPCS,-.35,.12,21HAXIAL FORCES ( KIPS ),0.,21)
307          CALL SYMBOL(XPCS+.5,-.50,.10,7HPROBLEM,0.,7)
308          CALLNUMBER(XPOS+1.25,-.50,.10,NPROB,0.,2HI5)
309          CALL PLOT(XL+5.,0.,-3)
310          GO TO 800
311      700  XA=0.
312          YA=0.
313          L=1
314          DO 221 I=1,NBAYLI
315          DO 211 K=1,NEH
316              CALL NUMBER(XA+.5,YA-(.2*ONEH),.12,PLOTAX(L),90.,4HF5.2)
317              L=L+1

```

```

318 211 YA=YA+CNEW
319 YA=0.
320 XA=XA+CNEL
321 221 CONTINUE
322 XPOS=(XL/2.)-1.
323 CALL PLOT(XPOS,-.35,3)
324 CALL PLOT(XPOS,-.35,2)
325 CALL SYMBOL(XPOS,-.35,.12,21HAXIAL FORCES ( KIPS ),0.,21)
326 CALL SYMBOL(XPOS+.5,-.50,.10,7HPROBLEM,0.,7)
327 CALL NUMBER(XPOS+1.25,-.50,.10,NPROB,0.,2H15)
328 CALL PLOT(XL+5.,0.,-3)
329 CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
330 CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
331 C PLOT NUMBER 4
332 C INSIDE STRESSES AT J-END AND K-END
333 CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
334 CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
335 800 XA=0.0
336 CALL PLOT(0.,0.,3)
337 CALL PLOT(0.,0.,2)
338 DO 14 I=1,NBAYLI
339 CALL PLOT(XA+0.,YH,1)
340 CALL PLOT(XA+ONEL,YH,1)
341 CALL PLOT(XA+ONEL,0.,1)
342 CALL PLOT(XA,0.,1)
343 CALL PLOT(XA+ONEL,0.,3)
344 CALL PLOT(XA+ONEL,0.,2)
345 XA=XA+CNEL
346 14 CONTINUE
347 YA=0.
348 LI=NBAYWI/2.
349 DO 15 J=1,LI
350 CALL PLOT(0.,YA,3)
351 CALL PLOT(0.,YA+ONEW,3)
352 CALL PLOT(0.,YA+ONEW,2)
353 CALL PLOT(XL,YA+ONEW,1)
354 CALL PLOT(XL,YA+2*ONEW,3)
355 CALL PLOT(XL,YA+2*ONEW,2)
356 CALL PLOT(0.,YA+2*ONEW,1)
357 YA=YA+2*ONEW
358 15 CONTINUE
359 C CHECK FOR FULL OR HALF ARCH.
360 IF(MANGLE.EQ.2) GO TO 900
361 XA=XL $YA=0. $L=1
362 C PLOT NUMBER FOUR.
363 C DEFINING INSIDE STRESSES AT J-END AND K-END OF ELEMENT.
364 DO 310 I=1,NBL
365 DO 300 K=1,NBAYWI
366 C STRSIJ=INSIDE STRESS AT J-END.
367 C STRSIK=INSIDE STRESS AT K-END.
368 CALL NUMBER(XA-.28,YA+(.1*ONEW),.12,STRSIJ(L),0.,4HF7.2)
369 CALL NUMBER(XA-.28,YA+(.8*ONEW),.12,STRSIK(L),0.,4HF7.2)
370 L=L+1
371 300 YA=YA+CNEW
372 YA=0.
373 XA=XA-CNEL
374 310 CCNTINUE
375 XPOS=(XL/2.)-2.
376 CALL PLOT(XPOS,-.35,3)
377 CALL PLOT(XPOS,-.35,2)
378 CALL SYMBOL(XPOS,-.35,.12,43HCOMPARATIVE STRESSES ON INSIDE FIBERS
379 1 (KSI),0.,43)
380 CALL SYMBOL(XPOS+1.5,-.50,.10,7HPROBLEM,0.,7)
381 CALL NUMBER(XPOS+2.25,-.50,.10,NPROB,0.,2H15)

```

```

382      CALL PLOT(XL+5.,0.,-3)
383      GO TO 1000
384  900  XA=0.
385      YA=0.
386      L=1
387      DO 321 I=1,NBAYLI
388      DO 311 K=1,NBH
389      CALL NLMBER(XA+(.15*ONEL),YA-(.2*ONEW),.12,STRSIJ(L),90.,4HF7.2)
390      CALL NLMBER(XA+(.85*ONEL),YA-(.2*ONEW),.12,STRSIK(L),90.,4HF7.2)
391      L=L+1
392  311  YA=YA+CNEW
393      YA=0.
394      XA=XA+CNEL
395  321  CONTINUE
396      XPCS=(XL/2.)-2.
397      CALL PLOT(XPOS,-.35,3)
398      CALL PLOT(XPOS,-.35,2)
399      CALL SYMBOL(XPCS,-.35,.12,43HCOMPARATIVE STRESSES ON INSIDE FIBERS
400      1 (KSI),J.,43)
401      CALL SYMBOL(XPCS+1.5,-.50,.10,7HPROBLEM,0.,7)
402      CALL NLMBER(XPOS+2.25,-.50,.10,NFROE,0.,2HI5)
403      CALL PLOT(XL+5.,0.,-3)
404  CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
405  CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
406  C      PLOT NLMBER 5
407  C      OUTSIDE STRESSES AT J-END AND K-END
408  CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
409  CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
410  1000 XA=0.0
411      CALL PLOT(0.,0.,3)
412      CALL PLOT(0.,0.,2)
413      DO 16 I=1,NBAYLI
414      CALL PLOT(XA+0.,YH,1)
415      CALL PLOT(XA+ONEL,YH,1)
416      CALL PLOT(XA+ONEL,0.,1)
417      CALL PLOT(XA,0.,1)
418      CALL PLOT(XA+ONEL,0.,3)
419      CALL PLOT(XA+ONEL,0.,2)
420      XA=XA+CNEL
421  16  CONTINUE
422      YA=0.
423      LI=NBAYHI/2.
424      DO 17 J=1,LI
425      CALL PLOT(0.,YA,3)
426      CALL PLOT(0.,YA+ONEW,3)
427      CALL PLOT(0.,YA+ONEW,2)
428      CALL PLOT(XL,YA+ONEW,1)
429      CALL PLOT(XL,YA+2*ONEW,3)
430      CALL PLOT(XL,YA+2*ONEW,2)
431      CALL PLOT(0.,YA+2*ONEW,1)
432      YA=YA+2*ONEW
433  17  CONTINUE
434  C      CHECK FOR FULL OR HALF ARCH.
435      IF(MANGLE.EQ.2) GO TO 1100
436      XA=XL  YA=0.  XL=1
437  C      PLOT NLMBER FIVE.
438  C      DEFINING OUTSIDE STRESSES AT J-END AND K-ENC OF ELEMENT.
439      DO 410 I=1,NBL
440      DO 400 K=1,NBAYHI
441  C      STRSOJ=OUTSIDE STRESS AT J-END.
442  C      STRSOK=OUTSIDE STRESS AT K-END.
443      CALL NLMBER(XA-.28,YA+(.1*ONEW),.12,STRSOJ(L),0.,4HF7.2)
444      CALL NLMBER(XA-.28,YA+(.8*ONEW),.12,STRSOK(L),0.,4HF7.2)
445      L=L+1

```



```

446      400 YA=YA+CNEW
447      YA=0.
448      XA=XA-CNEL
449      410 CONTINUE
450      XPOS=(XL/2.)-2.
451      CALL PLOT(XPOS,-.35,3)
452      CALL PLOT(XPOS,-.35,2)
453      CALL SYMBOL(XPCS,-.35,.12,44HCOMPARATIVE STRESSES ON OUTSIDE FIBER
454      1S (KSI),0.,44)
455      CALL SYMBOL(XPCS+1.5,-.50,.10,7HPROBLEM,0.,7)
456      CALL NLMBER(XPOS+2.25,-.50,.10,NPROB,0.,2H15)
457      CALL PLOT(XL+5.,0.,-3)
458      GO TO 1200
459      1100 XA=0.
460      YA=0.
461      L=1
462      DO 421 I=1,NBAYLI
463      DO 411 K=1,NBK
464      CALL NLMBER(XA+(.15*ONEL),YA-(.2*ONEW),.12,STRSOJ(L),90.,4HF7.2)
465      CALL NLMBER(XA+(.85*ONEL),YA-(.2*ONEW),.12,STRSOK(L),90.,4HF7.2)
466      L=L+1
467      411 YA=YA+CNEW
468      YA=0.
469      XA=XA+CNEL
470      421 CONTINUE
471      XPOS=(XL/2.)-2.
472      CALL PLOT(XPOS,-.35,3)
473      CALL PLOT(XPOS,-.35,2)
474      CALL SYMBOL(XPCS,-.35,.12,44HCOMPARATIVE STRESSES ON OUTSIDE FIBER
475      1S (KSI),0.,44)
476      CALL SYMBOL(XPCS+1.5,-.50,.10,7HPROBLEM,0.,7)
477      CALL NLMBER(XPCS+2.25,-.50,.10,NPROB,0.,2H15)
478      CALL PLOT(XL+5.,0.,-3)
479      1200 CONTINUE
480      CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
481      CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
482      C      PLOT NLMBER 6
483      C      LOADING VALUES
484      CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
485      CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
486      READ2,L
487      2 FORMAT(I10)
488      XA=0.0
489      CALL PLOT(0.,0.,3)
490      CALL PLOT(0.,0.,2)
491      DO 18 I=1,NBAYLI
492      CALL PLOT(XA+0.,YH,1)
493      CALL PLOT(XA+ONEL,YH,1)
494      CALL PLOT(XA+ONEL,0.,1)
495      CALL PLOT(XA,0.,1)
496      CALL PLOT(XA+ONEL,0.,3)
497      CALL PLOT(XA+ONEL,0.,2)
498      XA=XA+CNEL
499      18 CONTINUE
500      YA=0.
501      LI=NBAYHI/2.
502      DO 19 J=1,LI
503      CALL PLOT(0.,YA,3)
504      CALL PLOT(0.,YA+ONEW,3)
505      CALL PLOT(0.,YA+ONEW,2)
506      CALL PLOT(XL,YA+ONEW,1)
507      CALL PLOT(XL,YA+2*ONEW,3)
508      CALL PLOT(XL,YA+2*ONEW,2)
509      CALL PLOT(0.,YA+2*ONEW,1)

```

```

510      YA=YA+2*ONEW
511      19 CONTINUE
512      C CHECK FOR FULL OR HALF ARCH.
513      IF(MANGLE.EQ.2) GO TO 1400
514      NBAYWII=NBAYWI+1
515      XA=XL $YA=0.
516      DO 521 J=1,NBL
517      DO 511 K=1,NBAYWII
518      CALL NLMBR(XA-.28,YA+(.1*ONEW),.12,Q(L),0.,4HF6.2)
519      L=L+5
520      511 YA=YA+ONEW
521      YA=0.
522      XA=XA-CNEL
523      521 CONTINUE
524      XPOS=(XL/2.)-.75
525      CALL PLOT(XPOS,-.35,3)
526      CALL PLOT(XPOS,-.35,2)
527      CALL SYMBOL(XPOS,-.35,.12,16HLOADING ( KIPS ),0.,16)
528      CALL SYMBOL(XPOS+.25,-.50,.10,7HPROBLEM,0.,7)
529      CALL NLMBR(XPOS+1.0,-.50,.10,NPROB,0.,2HI5)
530      CALL PLOT(XL+5.,0.,-3)
531      GO TO 1600
532      1400 CONTINUE
533      XA=0.
534      YA=0.
535      DO 621 I=1,NBAYLI
536      DO 611 K=1,NBW
537      CALL NLMBR(XA+(.15*ONEL),YA-(.2*ONEW),.12,Q(L),90.,4HF6.2)
538      L=L+5
539      611 XA=XA+CNEL
540      XA=0.
541      621 YA=YA+ONEW
542      XPOS=(XL/2.)-.75
543      CALL PLOT(XPOS,-.35,3)
544      CALL PLOT(XPOS,-.35,2)
545      CALL SYMBOL(XPOS,-.35,.12,16HLOADING ( KIPS ),0.,16)
546      CALL SYMBOL(XPOS+.25,-.50,.10,7HPROBLEM,0.,7)
547      CALL NLMBR(XPOS+1.0,-.50,.10,NPROB,0.,2HI5)
548      CALL PLOT(XL+5.,0.,-3)
549      1600 CONTINUE
550      RETURN
551      END
552      SUBROUTINE SLALR(ONEL,CNEW,XL,YW,NBL,NEW)
553      C ONEL = ONE INCREMENT IN X DIRECTION
554      C ONEW = ONE INCREMENT IN Y DIRECTION
555      C XL = TOTAL LENGTH X DIRECTION
556      C YW = TOTAL LENGTH Y DIRECTION
557      C NBAYW = NUMBER OF BAYS WIDE
558      C NBAYL = NUMBER OF BAYS LONG
559      C NBL = NUMBER OF X INCREMENTS PLUS 1
560      C NBW = NUMBER OF Y INCREMENTS PLUS 1
561      C NBAYLI = NUMBER OF X INCREMENTS
562      C NBAYWI = NUMBER OF Y INCREMENTS
563      COMMON/3/CA,JERK,NBAYL,NBAYW,NUMPR,NPROB,MANGLE,JPRCB
564      2 FORMAT(2I10)
565      IF(NBAYW.GT.NBAYL) GO TO 1
566      C CHECK TO SEE WHICH DIMENSION IS LARGER
567      C SET UP SCALES TO A 10 INCH VERTICAL SCALE
568      YSCALE=10.
569      XSCALE=(10./NBAYW)*NBAYL
570      ONEL=XSCALE/NBAYL $XL=ONEL*NBAYL
571      ONEW=YSCALE/NBAYW $YW=ONEW*NBAYW
572      NBAYLI=NBAYL
573      NBAYWI=NBAYW

```

```

574      GO TO 5000
575      1. YSCALE=10.
576          XSCALE=(10./NBAYL)*NBAYW
577          ONEL=XSCALE/NBAYW $XL=ONEL*NBAYW
578          ONEW=YSCALE/NBAYL $ YW=ONEW*NBAYL
579          NBAYLI=NBAYW
580          NBAYWI=NBAYL
581      CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
582      CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
583      C PLOT NUMBER 1
584      C GRID SYSTEM
585      CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
586      CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
587      5000 X=0.
588      C ACTUAL DRAWING OF STRUCTURE WITH ELEMENTS
589      CALL PLOT(0.,0.,3)
590      CALL PLOT(0.,0.,2)
591      DO 10 I=1,NBAYLI
592      CALL PLOT(X+0.,YH,1)
593      CALL PLOT(X+ONEL,YH,1)
594      CALL PLOT(X+ONEL,0.,1)
595      CALL PLOT(X+0.,0.,1)
596      CALL PLOT(X+ONEL,0.,3)
597      CALL PLOT(X+ONEL,0.,2)
598      X=X+ONEL
599      10 CONTINUE
600      Y=0.
601      L=NBAYWI/2.
602      DO 11 J=1,L
603      CALL PLOT(0.,Y+0.,3)
604      CALL PLOT(0.,Y+ONEW,3)
605      CALL PLOT(0.,Y+ONEW,2)
606      CALL PLOT(XL,Y+ONEW,1)
607      CALL PLOT(XL,Y+2*ONEW,3)
608      CALL PLOT(XL,Y+2*ONEW,2)
609      CALL PLOT(0.,Y+2*ONEW,1)
610      Y=Y+2*ONEW
611      11 CONTINUE
612      T=NBAYWI/2. $ LT=T $Z=LT
613      IF(T.GT.2)GO TO 16
614      102 X=0. $Y=0.
615      CALL PLOT(0.,0.,3)
616      CALL PLOT(0.,0.,2)
617      DO 12 I=1,NBAYLI
618      IK=NBAYWI/2
619      DO 20 K=1,IK
620      CALL PLOT(X+ONEL,Y+ONEW,1)
621      CALL PLOT(X+0.,Y+2*ONEW,1)
622      Y=Y+2*ONEW
623      20 CONTINUE
624      X=X+0. $Y=YH
625      CALL PLOT(X+ONEL,YH,3)
626      CALL PLOT(X+ONEL,YH,2)
627      M=NBAYWI/2.
628      DO 15 J=1,M
629      CALL PLOT(X+0.,Y-ONEW,1)
630      CALL PLOT(X+ONEL,Y-2*ONEW,1)
631      Y=Y-2*ONEW
632      15 CONTINUE
633      X=X+ONEL $Y=0.
634      CALL PLOT(X,Y,3)
635      CALL PLOT(X,Y,2)
636      12 CONTINUE
637      GO TO 22

```

```

638      16 X=0.$Y=0.
639      CALL PLOT(0.,0.,3)
640      CALL PLOT(0.,0.,2)
641      DO 17 I=1,NBAYLI
642      IK=NBAYWI/2
643      DO 19 K=1,IK
644      CALL PLOT(X+ONEL,Y+ONEW,1)
645      CALL PLOT(X,Y+2*ONEW,1)
646      Y=Y+2.*ONEW
647      19 CONTINUE
648      CALL PLOT(X+ONEL,Y+ONEW,1)
649      X=X+0. $Y=YW
650      CALL PLOT(X,YW,3)
651      CALL PLOT(X,YW,2)
652      M=NBAYWI/2
653      DO 21 J=1,M
654      CALL PLOT(X+ONEL,Y-ONEW,1)
655      CALL PLOT(X,Y-2.*ONEW,1)
656      Y=Y-2.*ONEW
657      21 CONTINUE
658      CALL PLOT(X+ONEL,0.,1)
659      X=X+ONEL $ Y=0.
660      17 CONTINUE
661      22 CONTINUE
662  C      NUMBERING OF ELEMENTS
663      500 X=XL $Y=0. $SCALE=1.
664      NBL=NBAYLI+1
665      NBW=NBAYWI+1
666      DO 550 I=1,NBL
667      DO 540 K=1,NBW
668      CALL NUMBER(X-.07,Y+0.,.10,SCALE,0.,4HF4.0)
669      SCALE =SCALE +1.
670      Y=Y+ONEW
671      540 CONTINUE
672      Y=0.
673      X=X-ONEL
674      550 CCNTINLE
675      X=XL$NUMB=1$Y=0.
676      DO 2003 K=1,NBAYLI
677      DO 2000 I=1,NBAYWI
678      CALL NUMBER(X,Y+.4*ONEW,.07,NUMB,90.,2H13)
679      Y=Y+ONEW
680      NUMB=NUMB+1
681      2000 CONTINUE
682      2001 Y=0.
683      DO 2002 J=1,NBAYWI
684      CALL NUMBER(X-.5*ONEL,Y-.05*ONEW,.07,NUMB,90.,2H13)
685      NUMB=NUMB+1
686      CALL NUMBER(X-.25*ONEL,Y+.25*ONEW,.07,NUMB,135.,2H13)
687      NUMB=NUMB+1
688      CALL NUMBER(X-.375*ONEL,Y+.625*ONEW,.07,NUMB,45.,2H13)
689      Y=Y+ONEW
690      NUMB=NUMB+1
691      2002 CCNTINLE
692      CALL NUMBER(X-.5*ONEL,Y-.05*ONEW,.07,NUMB,90.,2H13)
693      X=X-ONEL
694      Y=0.$NUMB=NUMB+1
695      2003 CONTINUE
696      Y=0.$X=0.
697      DO 2004 I=1,NBAYWI
698      CALL NUMBER(X,Y+.4*ONEW,.07,NUMB,90.,2H13)
699      Y=Y+ONEW
700      NUMB=NUMB+1
701      2004 CCNTINLE

```

```

702      GO TO 800
703      800 CONTINUE
704          XPOS=(XSCALE/2.)-.5
705          CALL PLOT(XPOS,-.35,3)
706          CALL PLOT(XPOS,-.35,2)
707          CALL SYMBOL(XPCS,-.35,.12,11HGRID SYSTEM,0.,11)
708          CALL SYMBOL(XPCS,-.50,.10,7HPROBLEM,0.,7)
709          CALL NUMBER(XPCS+.65,-.50,.10,NPROB,0.,2HI5)
710          CALL PLOT(XSCALE+4.,0.,-3)
711      6000 RETURN
712      END
713      SUBROUTINE ARCHPLT(RK,X,Z,D,MANGLE,PLOTN,IB)
714      COMMON/3/CA,JEK,NBAYL,NBAYW,NUMPR,NPROB
715      CALL MAP (-1.,20.,-1.,20.,0.,1.,0.,1.)
716      C      RK = 1.0 / PCENT OF LOAD
717      C      X=X FRCH MAIN PROGRAM.
718      C      Z=Z FRCH MAIN PROGRAM.
719      C      D=DISPLACEMENT.
720      C      MANGLE=FULL OR HALF ARCH.
721      DIMENSION X(1),Z(1),D(1)
722      DIMENSION XXD(21),ZZD(21),XOR(21),ZOR(21),ZCOR(21)
723      C      NUMX = NUMBER OF NODES TO PLOT ARCH
724      C      NUMZ = NUMBER OF NODES TO PLOT CROWN DEFLECTIONS
725      READ 1,NUMX,NUMZ
726      1 FORMAT(2I10)
727      DO 10 I=1,NUMX
728      C      NOD = NODE NUMBERS TO BE USED TO PLOT THE ARCH
729      READ 1,NOD
730      MOD=5*NOD-4
731      MOD1=5*NOD-2
732      C      CALCULATION OF COORDINATES OF CENTERLINE ARCH. AND DEFLECTED CENTERLINE
733      C      ARCH.
734      C      XXD=DEFLECTED COORDINATES.
735      C      ZZD=DEFLECTED COORDINATES.
736      C      XOR=ORIGINAL COORDINATES.
737      C      ZOR=ORIGINAL COORDINATES.
738      XXD(I)=(D(MOD)*RK)*10.+X(NOD)
739      ZZD(I)=(D(MOD1)*RK)*10.+Z(NOD)
740      XOR(I)=X(NOD)
741      ZOR(I)=Z(NOD)
742      10 CONTINUE
743      C      MANGLE = 1 OR 2 DEPENDING ON WHETHER IT IS A FULL ARCH OR HALF ARCH
744      IF(MANGLE.EQ.2)GO TO 100
745      DO 11 I=1,NUMX
746      C      SCALING OF COORDINATES.
747      XXD(I)=XXD(I)/(-50.)
748      ZZD(I)=ZZD(I)/50.
749      XOR(I)=XOR(I)/(-50.)
750      ZOR(I)=ZOR(I)/50.
751      11 CONTINUE
752      C      PLOTTING AXES.
753      YY=10.
754      CALL PLOT(0.,YY,3)
755      CALL PLOT(0.,YY,2)
756      DO 12 IT=1,10
757      CALL PLOT(0.,YY,1)
758      CALL PLOT(0.,YY-1.,1)
759      CALL PLOT(-.1,YY-1.,1)
760      CALL PLOT(0.,YY-1.,1)
761      12 YY=YY-1.
762      XX=0.
763      DO 13 IX=1,16
764      CALL PLOT(XX,0.,1)
765      CALL PLOT(XX+1.,0.,1)

```

```

766      CALL PLOT(XX+1.,-.1,1)
767      CALL PLOT(XX+1.,0.,1)
768      13 XX=XX+1.
769      C      NUMBERING OF AXES.
770      SCALINC=50. $YY=10. $YSCALE=10.*SCALINC
771      DO 14 IY=1,11
772      CALL NUMBER(-1.,YY,.10,YSCALE,0.,4HF8.2)
773      YY=YY-1.
774      14 YSCALE=YSCALE-SCALINC
775      XSCALI=50. $XX=0. $XSCA=0.
776      DO 15 IX=1,17
777      CALL NUMBER(XX-.25,-.25,.10,XSCA,0.,4HF8.2)
778      XX=XX+1.
779      15 XSCA=XSCA+XSCALI
780      CALL PLOT(0.,0.,3)
781      CALL PLOT(0.,0.,2)
782      DO 16 I=1,NUMX
783      C      PLOTTING DEFLECTED ARCH.
784      CALL SYMBOL(XXC(I),ZZD(I),.07,1,0.,-1)
785      16 CONTINUE
786      DO 17 I=1,NUMX
787      C      PLOTTING ORIGINAL ARCH.
788      CALL SYMBOL(XOR(I),ZOR(I),.07,2,0.,-1)
789      17 CONTINUE
790      IF(PLOTN)200,200,300
791      200 CALL SYMBOL (6.,-.50,.12,49HDEFLECTIONS-LINEAR SOLUTION (MAGNIFICA
792      ITION OF 10),0.,48)
793      CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
794      CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
795      C      PLOT NUMBER 7
796      C      CENTER ARCH AND DEFLECTED CENTER ARCH(LINEAR SOLUTION)
797      CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
798      CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
799      GO TO 400
800      300 CALL SYMBOL(6.,-.50,.12,52HDEFLECTIONS-NONLINEAR SOLUTION (MAGNIFI
801      CATION OF 10),0.,51)
802      CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
803      CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
804      C      PLOT NUMBER 9
805      C      CENTER ARCH AND DEFLECTED CENTER ARCH(NONLINEAR SOLUTION)
806      CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
807      CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
808      400 CONTINUE
809      CALL SYMBOL(7.5,-.65,.10,7HPROBLEM,0.,7)
810      CALL NUMBER(8.5,-.65,.10,NPROB,0.,2HIS)
811      CALL PLOT(20.,0.,-3)
812      IF(I0.EQ.1)22,25
813      100 DO 26 I=1,NUMX
814      XX0(I)=XX0(I)/50.
815      ZZD(I)=ZZD(I)/50.
816      XOR(I)=XOR(I)/50.
817      ZOR(I)=ZOR(I)/50.
818      26 CONTINUE
819      C      PLOTTING AXES.
820      YY=10. $XX=16.
821      CALL PLOT(XX,YY,3)
822      CALL PLOT(XX,YY,2)
823      DO 27 IT=1,10
824      CALL PLOT(XX,YY,1)
825      CALL PLOT(XX,YY-1.,1)
826      CALL PLOT(XX-.1,YY-1.,1)
827      CALL PLOT(XX,YY-1.,1)
828      27 YY=YY-1.
829      XX=0.

```

```

830      DO 28 IX=1,32
831      CALL PLOT(XX,0.,1)
832      CALL PLOT(XX+1.,0.,1)
833      CALL PLOT(XX+1.,-1.,1)
834      CALL PLCT(XX+1.,0.,1)
835      28 XX=XX+1.
836      C      NUMBERING OF AXES.
837      YS=50. $YY=10. $YSCA=10.*YS
838      DO 29 IY=1,11
839      CALL NLMBER(7.,YY,.10,YSCA,0.,4HF8.2)
840      YY=YY-1.
841      29 YSCA=YSCA-YS
842      CALL SYMBOL(-1.5,4.,.10,1HZ,90.,1)
843      XSCAIN=50. $XX=0. $XSCA=-400.
844      DO 30 IX=1,17
845      CALL NUMBER(XX-.25,-.25,.10,XSCA,0.,4HF8.2)
846      XX=XX+1.
847      30 XSCA=XSCA+XSCAIN
848      CALL SYMBOL(8.,-1.,.10,1HX,0.,1)
849      XX=8. $YY=0.
850      CALL PLOT(XX,YY,3)
851      CALL PLOT(XX,YY,2)
852      DO 31 I=1,NUMX
853      C      PLOTTING DEFLECTED ARCH.
854      CALL SYMBOL(XXC(I)+XX,ZZD(I),.07,1,0.,-1)
855      31 CONTINUE
856      DO 32 I=1,NUMX
857      C      PLOTTING ORIGINAL ARCH.
858      CALL SYMBOL(XOR(I)+XX,ZOR(I),.07,2,0.,-1)
859      32 CONTINUE
860      IF(PLOTN)201,201,301
861      201 CALL SYMBOL (12.,-.50,.12,4HDEFLECTIONS-LINEAR SOLUTION (MAGNIFIC
862      IATION OF 10),0.,48)
863      GO TO 401
864      301 CALL SYMBOL (12.,-.50,.12,5HDEFLECTIONS-NONLINEAR SOLUTION (MAGNI
865      FICATION OF 10),0.,51)
866      401 CONTINUE
867      CALL SYMBOL (15.,-.65,.10,7HPROBLEM,0.,7)
868      CALL NLMBER(16.,-.65,.10,NPROB,0.,2H15)
869      CALL SYMBOL(9.,5.,.12,3HRK=,0.,3)
870      CALL NLMBER(9.5,5.,.12,RK,0.,4HF5.2)
871      CALL PLOT(40.,0.,-3)
872      IF(18.EQ.1)GO TO 22
873      25 DO 18 I=1,NUMZ
874      CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
875      CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
876      C      PLOT NLMBER 8
877      C      CROWN DEFLECTIONS
878      CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
879      CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
880      C      NOD=NODE NUMBERS TO BE USED TO CALCULATE CROWN DEFLECTIONS.
881      READ1,NOD
882      MOD1=5*NOD-2
883      C      CALCULATION OF CROWN DEFLECTIONS.
884      C      ZCOR=CROWN DEFLECTIONS.
885      ZCOR(I)=(D(MOD1)*RK)
886      18 CONTINUE
887      C      DRAWING AXES.
888      XX=0. $YY=5.
889      CALL PLOT(XX,YY,3)
890      CALL PLCT(XX,YY,2)
891      TZ=8./NUMZ
892      DO 19 I=1,NUMZ
893      CALL PLOT(XX,YY,1)

```

```

894      CALL PLOT(XX+TZ,YY,1)
895      CALL PLOT(XX+TZ,YY-.1,1)
896      CALL PLOT(XX+TZ,YY,1)
897  19 XX=XX+TZ
898      XX=0.  $YY=5.
899      CALL PLOT(XX,YY,3)
900      DO 21 I=1,NUMZ
901  C      PLOTTING OF CROWN DEFLECTIONS.
902      CALL SYMBOL(XX,ZCOR(I)+YY,.07,2,0.,-1)
903  21 XX=XX+TZ
904      CALL SYMBOL(2.5,-.35,.12,28HCROWN DISPLACEMENTS (INCHES),0.,28)
905      CALL SYMBOL(2.,-.75,.12,32HVERTICAL SCALE - 1 INCH = 1 INCH,0.,32)
906      CALL SYMBOL(3.,-.5,.10,7HPROBLEM,0.,7)
907      CALL NUMBER(4.,-.5,.10,NPROB,0.,2HI5)
908      CALL PLOT(12.,0.,-3)
909  22 CCNTINLE
910      RETURN
911      END
912      SUBROUTINE STRESSP
913      CALL MAP(-1.,11.,-1.,11.,0.,1.,0.,1.)
914      COMMON/1/A(1000),B(1000),C(1000),D(1000),E(10),
915      1      F(1000),G(1000),
916      2      H(220),O(220),P(220),S(231),U(231),V(1155),W(1155)
917      DIMENSION X(100),Y(100),T(100),R(100),R1(100),X1(1000),Y1(1000),X2
918      1(1000),Y2(1000)
919  C      A-STRSCJ
920  C      B-STRSIJ
921  C      C-STRSCK
922  C      D-STRSIK
923  C      E(1)=CA,E(2)=JERK,E(3)=NBAYL,E(4)=NBAYW,E(5)=NUMPR,E(6)=NPROB
924      I=(E(4)/2.)*E(3)+1.
925      NBAYL=E(3)  $ NBAYW=E(4)  $ NUMPR=E(5)  $ NPROB=E(6)  $ CA=E(1)
926      NUM=I+NBAYL
927      NUMT=NEAYL
928      J=NBAYL+1
929      PRINT1,I,NUM,NUMT,J
930  1  FORMAT(4(5X,I10))
931      F(1)=A(I)  $F(J)=C(NUM)
932      G(1)=B(I)  $G(J)=D(NUM)
933      DO 10 K=2,NBAYL
934      F(K)=(C(I)+A(I+1))/2.
935      G(K)=(C(I)+B(I+1))/2.
936      PRINT3000,F(K),G(K),C(I),A(I+1),D(I),B(I+1)
937  3000  FORMAT(5X,5HF(K)=,F10.4,5X,5HG(K)=,F10.4,5X,5HC(I)=,F10.4,5X,7H-A(I
938      1+1)=,F10.4,5X,5HD(I)=,F10.4,5X,7HB(I+1)=,F10.4)
939      I=I+1
940  10  CCNTINLE
941      PRINT 3001,CA
942  3001  FORMAT(5X,3HCA=,F10.4)
943      Y(1)=0.
944      X(1)=8.
945      DO 12 K=2,81
946      Y(K)=Y(K-1)+.1
947      X(K)=SQRTF(64-Y(K)*Y(K))
948  12  CCNTINLE
949      PI=3.14159265
950      BETA=(PI-CA)/2.
951      L=0
952      READ 2, SF
953  2  FORMAT(F10.4)
954      DO 13 K=1,J
955      T(K)=((PI-CA)/2.)+L*(CA/20.)
956      R(K)=8.+(SF*F(K))
957      R1(K)=8.+(SF*G(K))

```



```

958      PRINT 3002,T(K),R(K),R1(K)
959 3002 FORMAT(5X,5HT(K)=,F10.4,5X,5HR(K)=,F10.4,5X,6HR1(K)=,F10.4)
960      L=L+1
961      13 CONTINUE
962      DO 14 K=1,J
963          TAK=T(K)
964          X1(K)=R(K)*COS(TAK)
965          Y1(K)=R(K)*SIN(TAK)
966          X2(K)=R1(K)*COS(TAK)
967          Y2(K)=R1(K)*SIN(TAK)
968      14 CONTINUE
969          ZEROX=8.*COS(T(1))
970          ZEROY=8.*SIN(T(1))
971          LP=0
972 1000 YY=8. $LP=LP+1
973      CALL PLOT(0.,YY,3)
974      CALL PLOT(0.,YY,2)
975      DO 15 K=1,8
976          CALL PLOT(0.,YY-1.,1)
977          CALL PLOT(-.1,YY-1.,1)
978          CALL PLOT(0.,YY-1.,1)
979          YY=YY-1.
980      15 CONTINUE
981          XX=0.
982          DO 16 K=1,9
983              CALL PLOT(XX+1.,0.,1)
984              CALL PLOT(XX+1.,-.1,1)
985              CALL PLOT(XX+1.,0.,1)
986              XX=XX+1.
987      16 CONTINUE
988          YY=8. $ XX=-.5
989          NUM=8
990          DO 5000 I=1,9
991              CALL NUMBER(XX,YY,.10,NUM,0.,2H13)
992              NUM=NUM-1
993 5000 YY=YY-1.
994          NUMX=0 $ YY=-.3 $ XX=0
995          DO 5001 I=1,10
996              CALL NUMBER(XX,YY,.10,NUMX,0.,2H13)
997              NUMX=NUMX+1
998 5001 XX=XX+1
999          CALL PLOT(0.,0.,3)
1000         CALL PLOT(0.,0.,2)
1001         DO 17 K=1,81
1002             CALL PLOT(X(K),Y(K),1)
1003         17 CONTINUE
1004             CALL PLOT(0.,0.,3)
1005             CALL PLOT(0.,0.,2)
1006             CALL PLOT(ZEROX,ZEROY,1)
1007             CALL PLOT(0.,0.,3)
1008             CALL PLOT(0.,0.,2)
1009             UNIT=1./SF
1010             IF(LP.EQ.2)GO TO 2000
1011 CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
1012 CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
1013 C      PLOT NUMBER 10
1014 C      AVERAGE OF J-END AND K-END OUTSIDE STRESSES ALONG CENTER ARCH
1015 CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
1016 CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
1017         DO 18 K=1,J
1018             CALL SYMBOL(X1(K),Y1(K),.07,2,0.,-1)
1019         18 CONTINUE
1020             CALL SYMBOL(3.,-.50,.12,16HOUTSIDE STRESSES,0.,16)
1021             CALL SYMBOL(3.2,-.70,.10,7HPROBLEM,0.,7)

```

```

1022      CALL NLMBER(4.0,-.70,.10,NPROB,0.,2HI5)
1023      CALL SYMBOL(J,-.9,.10,7H UNIT =,0.,8)
1024      CALL NLMBER(3.7,-.9,.10,UNIT,0.,4HF5.2)
1025      CALL SYMBOL(4.0,-.9,.10,3H KSI,0.,3)
1026      CALL PLOT(12.,0.,-3)
1027      GO TO 1000
1028      CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
1029      CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
1030      C      PLOT NLMBER 11
1031      C      AVERAGE OF J-END AND K-END INSIDE STRESSES ALONG CENTER ARCH
1032      CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
1033      CXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
1034      2000 DO 19 K=1,J
1035          CALL SYMBOL(X2(K),Y2(K),.07,2,0.,-1)
1036      19 CONTINUE
1037      CALL SYMBOL(3.,-.50,.12,15HINSIDE STRESSES,0.,15)
1038      CALL SYMBOL(3.2,-.7,.10,7H PROBLEM,0.,7)
1039      CALL NLMBER(4.0,-.7,.10,NPROB,0.,2HI5)
1040      CALL SYMBOL(3.,-.9,.10,7H UNIT =,0.,8)
1041      CALL NLMBER(3.7,-.9,.10,UNIT,0.,4HF5.2)
1042      CALL SYMBOL(4.0,-.9,.10,3H KSI,0.,3)
1043      CALL PLOT(12.,0.,-3)
1044      RETURN
1045      END

```

APPENDIX II

INPUT INSTRUCTIONS FOR COMPUTER PROGRAMS

1. INTRODUCTION

The basic program, SANOS, can be executed independently but will yield only printed results; to obtain plots of the results, the SAN1PLT program must be executed.

2. DATA FOR SANOS

<u>Format</u>	<u>Information</u>
I 10	(1) NUMPR - number of problems in this computer run
8I10	(2) NPROB, NCODE, NBAYL, NBAYW, NLOAD, NSUPN, NRK, MANGLE where: NPROB = problem identification number NCODE = 0, nodes numbered in direction of shell axis = 1, nodes numbered along arch NBAYL = number of bays along shell axis NBAYW = number of bays along arch NLOAD = number of loads on shell NSUPN = number of nodes which have supports NRK = number of Runge-Kutta (loading) intervals MANGLE = 1, one-half arch (symmetrical loading) = 2, full arch (unsymmetrical loading)
3F10.0	(3) SPAN, HEIGHT, SENGTH where: SPAN = span of shelter (total) (inches) HEIGHT = height of shelter (inches) SENGTH = length of shelter (inches)
7F10.0	(4) *THICKM, THICKW, UTM, THICKA, ULTSTR, E, R where: THICKM = equivalent thickness of shell-bending-strong axis (inches) THICKW = equivalent thickness of shell-bending-weak axis (inches) UTM = ultimate moment (inches-kip/inch) THICKA = equivalent thickness of shell - axial (inches) ULTSTR = ultimate axial stress (ksi/inch) E = modulus of elasticity (ksi) R = curve-fitting parameter

*This information is obtained from laboratory tests.

<u>Format</u>	<u>Information</u>
3F10.0	(5) COUT, CIN, RATMOD where: COUT = distance from neutral axis to outside fibers (inches) CIN = distance from neutral axis to inside fibers (inches) RATMOD = E strong/E weak (ratio of moduli)
8F10.0	(6) PCENT (I), I = 1, NRK percent of load (in decimal) on each increment of loading
6I10	(7) NODE, NP(J), J = 1,5 support information 0 indicates no support 1 indicates supported against displacement in x direction 2 indicates supported against displacement in y direction 3 indicates supported against displacement in z direction 4 indicates supported against rotation about x axis 5 indicates supported against rotation about y axis
I10, F10.0	(8) I, D(I) NLOAD times loading conditions (I indicates coordinate number)
3I3, I11	(9) MN, JM, KM, MTYPE where: MN = member number JM = j end of member KM = k end of member MTYPE = 1, interior member along arch 2, exterior member along arch 3, interior horizontal member 4, exterior horizontal member 5, diagonal member
F10.0	(10) CONTROL where: CONTROL = 0 -- no plots required = value -- plots required

3. DATA FOR SAN1PLT

<u>Format</u>	<u>Information</u>
F10.0	(1) PLOTCON If PLOTCON = 0, signals last set of plots If PLOTCON = value, more plots to come
I10	(2) L (Determines type of loads) L = 1 -- loads in x direction L = 2 -- loads in y direction L = 3 -- loads in z direction L = 4 -- moment about x axis L = 5 -- moment about y axis

<u>Format</u>	<u>Information</u>
2I10	(3) NUMX, NUMZ NUMX = number of nodes around arch desired for plotting NUMZ = number of nodes along crown for plotting
I10	(4) NOD (node numbers for arch deflection plot of linear solution, NUMX of them)
I10	(5) NOD (node numbers for crown deflection plot of linear solution, NUMZ of them)
I10	(6) NOD (node numbers for arch deflection plot of non-linear solution, NUMX of them)
F10.4	(7) SF (scale factor desired for plots of inside and outside stresses)

APPENDIX III

SAMPLE INPUT DATA FOR SANOS

Test problem 5 is presented since it is an example of unsymmetric loading.

5	0	10	20	19	23	6	2
590.	290.	360.					
2.48	0.15	15.0	0.021	81.5	30000.	2.0	
2.00	12.0	7.5					
.1667	.1667	.1667	.1667	.1667	.1667		
1	1	2	3	4			
2	1	2	3	4			
3	1	2	3	4			
4	1	2	3	4			
5	1	2	3	4			
6	1	2	3	4			
7	1	2	3	4			
8	1	2	3	4			
9	1	2	3	4			
10	1	2	3	4			
11	1	2	3	4			
221	1	2	3	4			
222	1	2	3	4			
223	1	2	3	4			
224	1	2	3	4			
225	1	2	3	4			
226	1	2	3	4			
227	1	2	3	4			
228	1	2	3	4			
229	1	2	3	4			
230	1	2	3	4			
231	1	2	3	4			
116	0	2	0	0			
452	-2.08						
463	-2.08						
473	-2.08						
483	-2.08						
508	-1.52						
518	-1.52						
528	-1.52						
538	-1.52						
553	-2.09						
558	-4.17						
563	-4.17						
568	-4.17						
573	-4.17						
578	-4.17						
583	-4.17						
588	-4.17						
593	-4.17						
598	-4.17						
603	-2.00						

1001002	4	56013025	5
2002003	4	57014024	5
3003004	4	58014025	1
4004005	4	59014026	5
5005006	4	60015025	5
6006007	4	61015026	1
7007008	4	62015027	5
8008009	4	63016026	5
9009010	4	64016027	1
10010011	4	65016028	5
11001012	2	66017027	5
12001013	5	67017028	1
13002012	5	68017029	5
14002013	1	69018028	5
15002014	5	70018029	1
16003013	5	71018030	5
17003014	1	72019029	5
18003015	5	73019030	1
19004014	5	74019031	5
20004015	1	75020030	5
21004016	5	76020031	1
22005015	5	77020032	5
23005016	1	78021031	5
24005017	5	79021032	1
25006016	5	80021033	5
26006017	1	81022032	5
27006018	5	82022033	2
28007017	5	83023024	3
29007018	1	84024025	3
30007019	5	85025026	3
31008018	5	86026027	3
32008019	1	87027028	3
33008020	5	88028029	3
34009019	5	89029030	3
35009020	1	90030031	3
36009021	5	91031032	3
37010020	5	92032033	3
38010021	1	93033034	3
39010022	5	94034035	5
40011021	5	95035036	5
41011022	2	96036037	1
42012013	3	97037038	5
43013014	3	98038039	5
44014015	3	99039040	1
45015016	3	10004001	5
46016017	3	10104002	5
47017018	3	10204003	1
48018019	3	10304004	5
49019020	3	10404005	5
50020021	3	10504006	1
51021022	3	10604007	5
52012023	2	10704008	5
53012024	5	10804009	1
54013023	5	10904010	5
55013024	1	11004011	5

111020040	1
112020041	5
113030040	5
114030041	1
115030042	5
116031041	5
117031042	1
118031043	5
119032042	5
120032043	1
121032044	5
122032043	5
123033044	2
124034025	2
125035036	2
126036037	2
127037038	3
128038036	2
129039040	3
130040041	3
131041042	3
132042043	3
133043044	3
134034045	2
135034046	5
136035045	5
137035046	1
138035047	5
139036046	5
140036047	1
141036048	5
142037047	5
143037048	1
144037049	5
145038048	5
146038049	1
147038050	5
148039049	5
149039050	1
150039051	5
151040050	5
152040051	1
153040052	5
154041051	5
155041052	1
156041053	5
157042052	5
158042053	1
159042054	5
160042053	5
161042054	1
162043055	5
163044054	5
164044055	2
165045046	3

166046047	2
167047048	2
168048040	2
169049050	2
170050051	2
171051052	2
172052052	2
173053054	3
174054055	2
175045056	2
176046057	5
177046056	5
178046057	1
179046058	5
180047057	5
181047058	1
182047059	5
183048058	5
184048059	1
185048060	5
186049060	5
187049060	1
188049061	5
189050060	5
190050061	1
191050062	5
192051061	5
193051062	1
194051063	2
195052062	5
196052063	1
197052064	5
198053063	5
199053064	1
200053065	5
201054064	5
202054065	1
203054066	5
204055065	5
205055066	2
206056067	2
207057069	2
208058060	3
209059060	2
210060061	2
211061062	2
212062063	3
213062064	2
214064065	2
215065064	3
216056067	2
217056068	5
218057067	5
219057068	1
220057069	5

221050068	5
222050069	1
223050070	5
224050069	5
225050070	1
226050071	5
227060070	5
228060071	1
229060072	5
230061071	5
231061072	1
232061073	5
233062072	5
234062073	1
235062074	5
236063073	5
237063074	1
238063075	5
239064074	5
240064075	1
241064076	5
242065075	5
243065076	1
244065077	5
245066076	5
246066077	2
247067069	3
248069069	3
249069070	3
250070071	3
251071072	2
252072073	3
253073074	2
254074075	3
255075076	2
256076077	3
257067079	2
258067079	5
259069078	5
260069079	1
261069080	5
262069079	5
263069080	1
264069081	5
265070080	5
266070081	1
267070082	5
268071081	5
269071082	1
270071082	5
271072082	5
272072083	1
273072084	5
274073083	5
275073084	1

276073085	5
277074084	5
278074085	1
279074086	5
280075085	5
281075086	1
282075087	5
283076086	5
284076087	1
285076088	5
286077087	5
287077089	2
288078087	3
289078088	2
290080081	2
291081082	2
292082083	2
293083084	2
294084085	3
295085086	2
296086087	2
297087088	2
298078089	2
299079090	5
300079089	5
301079090	1
302079091	5
303080090	5
304080091	1
305080092	5
306081091	5
307081092	1
308081093	5
309082092	5
310082093	1
311082094	5
312083093	5
313083094	1
314083095	5
315084094	5
316084095	1
317084096	5
318085095	5
319085096	1
320085097	5
321086096	5
322086097	1
323086098	5
324087097	5
325087098	1
326087099	5
327088098	5
328088099	2
329089099	3
330090091	3

331001092	3	286103112	1
332092093	3	387102114	5
333002094	3	388102113	5
334094095	3	389103114	1
335095096	3	390103115	5
336004097	2	391104114	5
337007098	2	392104115	1
338008099	2	393104116	5
339009100	2	394105115	5
340009101	5	395105116	1
341099100	5	396105117	5
342099101	1	397106116	5
343099102	5	398106117	1
344091101	5	399106118	5
345001102	1	400107117	5
346091103	5	401107118	1
347092102	5	402107119	5
348092103	1	403108118	5
349092104	5	404108119	1
350093103	5	405108120	5
351003104	1	406109119	5
352003105	5	407109120	1
353004104	5	408109121	5
354004105	1	409110120	5
355004106	5	410110121	2
356095105	5	411111112	3
357095106	1	412112113	3
358095107	5	413113114	3
359096106	5	414114115	3
360096107	1	415115116	3
361006108	5	416116117	2
362007107	5	417117118	2
363007108	1	418118119	2
364007109	5	419119120	3
365008108	5	420120121	3
366009109	1	421111122	2
367009110	5	422111123	5
368009110	5	423112122	5
369009110	2	424112123	1
370100101	2	425112124	5
371101102	2	426113122	5
372102103	2	427113124	1
373102104	2	428113125	5
374104105	2	429114124	5
375105106	2	430114125	1
376106107	3	431114126	5
377107108	2	432115125	5
378108109	2	433115126	1
379109110	2	434115127	5
380100111	2	435116126	5
381100112	5	436116127	1
382101111	5	437116128	5
383101112	1	438117127	5
384101113	5	439117129	1
385102112	5	440117129	5

441113128	5	496136137	3
442113129	1	497137133	3
443113130	5	498138139	3
444119129	5	499139140	3
445119130	1	500140141	3
446119131	5	501141142	3
447120120	5	502142143	3
448120131	1	503143144	2
449120132	5	504143145	5
450121131	5	505144144	5
451121132	2	506144145	1
452122123	2	507144146	5
453123124	3	508145145	5
454124125	3	509145146	1
455125126	3	510145147	5
456126127	3	511146146	5
457127128	2	512146147	1
458129129	3	513146148	5
459129130	3	514147147	5
460130131	3	515147148	1
461131132	3	516147149	5
462122133	2	517148148	5
463122134	5	518148149	1
464123133	5	519149150	5
465123134	1	520149149	5
466123135	5	521149150	1
467124134	5	522149151	5
468124135	1	523140150	5
469124136	5	524140151	1
470125135	5	525140152	5
471125136	1	526141151	5
472125137	5	527141152	1
473126136	5	528141153	5
474126137	1	529142152	5
475126138	5	530142152	1
476127137	5	531142154	5
477127138	1	532143153	5
478127139	5	533143154	2
479128138	5	534144145	3
480128139	1	535145146	3
481128140	5	536146147	3
482129139	5	537147148	3
483129140	1	538148149	3
484129141	5	539149150	3
485130140	5	540150151	2
486130141	1	541151152	3
487131141	5	542152153	3
488131141	5	543153154	3
489131142	1	544144155	2
490131143	5	545144156	5
491132142	5	546145155	5
492132143	2	547145156	1
493133134	3	548145157	5
494134135	3	549146156	5
495135136	3	550146157	1

551146158	5	606162173	1
552147157	5	607162174	5
553147158	1	608163173	5
554147159	5	609163174	1
555148158	5	610163175	5
556148159	1	611164174	5
557148160	5	612164175	1
558149159	5	613164176	5
559149160	1	614165175	5
560149161	5	615165176	2
561150160	5	616166167	3
562150161	1	617167168	3
563150162	5	618168169	3
564151161	5	619169170	3
565151162	1	620170171	3
566151163	5	621171172	3
567152162	5	622172173	3
568152163	1	623173174	3
569152164	5	624174175	3
570153162	5	625175176	3
571153164	1	626166177	2
572153165	5	627166178	5
573154164	5	628167177	5
574154165	2	629167178	1
575155156	3	630167179	5
576156157	3	631168178	5
577157158	3	632168179	1
578158159	3	633168180	5
579159160	3	634169179	5
580160161	3	635169180	1
581161162	3	636169181	5
582162163	3	637170180	5
583163164	3	638170181	1
584164165	3	639170182	5
585155166	2	640171181	5
586155167	5	641171182	1
587156166	5	642171183	5
588156167	1	643172182	5
589156168	5	644172183	1
590157167	5	645172184	5
591157168	1	646173183	5
592157169	5	647173184	1
593158168	5	648173185	5
594158169	1	649174184	5
595158170	5	650174185	1
596159169	5	651174186	5
597159170	1	652175185	5
598159171	5	653175186	1
599160170	5	654175187	5
600160171	1	655176186	5
601160172	5	656176187	2
602161171	5	657177178	3
603161172	1	658178179	3
604161173	5	659179180	3
605162172	5	660180181	3

661181182	3
662182183	3
663182184	3
664184185	3
665185186	3
666186187	3
667177188	2
668177189	5
669178188	5
670178189	1
671179190	5
672179189	5
673179190	1
674179191	5
675180190	5
676180191	1
677180192	5
678181191	5
679181192	1
680181193	5
681182192	5
682182193	1
683182194	5
684183193	5
685183194	1
686183195	5
687184194	5
688184195	1
689184196	5
690185195	5
691185196	1
692185197	5
693186196	5
694186197	1
695186198	5
696187197	5
697187198	2
698188198	3
699189190	3
700190191	3
701191192	3
702192193	3
703193194	3
704194195	3
705195196	3
706196197	3
707197198	3
708188199	2
709188200	5
710189199	5
711189200	1
712189201	5
713190200	5
714190201	1
715190202	5

716191201	5
717191202	1
718191203	5
719192202	5
720192203	1
721192204	5
722193203	5
723193204	1
724193205	5
725194204	5
726194205	1
727194206	5
728195205	5
729195206	1
730195207	5
731196206	5
732196207	1
733196208	5
734197207	5
735197208	1
736197209	5
737198208	5
738198209	2
739199200	3
740200201	3
741201202	3
742202203	3
743203204	3
744204205	2
745205206	3
746206207	3
747207208	3
748208209	3
749199210	2
750199211	5
751200210	5
752200211	1
753200212	5
754201211	5
755201212	1
756201213	5
757202212	5
758202213	1
759202214	5
760203213	5
761203214	1
762203215	5
763204214	5
764204215	1
765204216	5
766205215	5
767205216	1
768205217	5
769206216	5
770206217	1

771206218	5	626226227	4
772207217	5	627227228	4
773207218	1	828228229	4
774207219	5	829229230	4
775208218	5	830230231	4
776208219	1		
777208220	5		
778208216	5		
779209220	2		
780210211	3		
781211212	3		
782212213	3		
783213214	3		
784214215	3		
785215216	3		
786216217	3		
787217218	3		
788218219	3		
789219220	3		
790210221	2		
791210222	5		
792211221	5		
793211222	1		
794211223	5		
795212222	5		
796212223	1		
797212224	5		
798213223	5		
799213224	1		
800213225	5		
801214224	5		
802214225	1		
803214226	5		
804215225	5		
805215226	1		
806215227	5		
807216226	5		
808216227	1		
809216228	5		
810217227	5		
811217228	1		
812217229	5		
813218228	5		
814218229	1		
815218230	5		
816219229	5		
817219230	1		
818219231	5		
819220230	5		
820220231	2		
821221222	4		
822222223	4		
823223224	4		
824224225	4		
825225226	4		

APPENDIX IV

SAMPLE OUTPUT DATA FOR SANOS

Test problem 5 is presented since it is an example of unsymmetrical loading.

PROBLEM NUMBER 5

NONLINEAR ANALYSIS OF ORTHOTROPIC SHELLS
MATERIAL NONLINEARITY ** RICHARD FORMULATION
PLASTIC ANALYSIS ** SMITH PLASTIC MODEL
GEOMETRIC NONLINEARITY ** INCREMENTAL TECHNIQUE

METHOD OF NUMBERING NODES *****	NCODE =	0
NUMBER OF RAYS LONG *****	NRAYL =	10
NUMBER OF RAYS WIDE *****	NRAYW =	20
NUMBER OF LOADS *****	NLOAD =	14
NUMBER OF NODES WITH SUPPORTS *****	NSUPN =	23
NUMBER OF RUNGE-KUTTA INTERVALS *****	NRK =	6
AMOUNT OF STRUCTURE MODEL *****	HANGLF =	2

SPAN OF STRUCTURE *****	SPAN =	590.00
HEIGHT OF STRUCTURE *****	HEIGHT =	295.00
LENGTH OF SHELL *****	SENGTH =	360.00

THICKNESS OF SHELL (RHOING) *****	THICKH =	2.44
CORREL THICKNESS OF METAL (THICKW CAL) *	THICKW =	.15
ULTIMATE MOMENT (IN-KIPS/IN) *****	ULTM =	15.00
THICKNESS OF SHELL (AXIAL) *****	THICKA =	.02
ULT. AXIAL STRESS (KIPS/SQ.IN/INCH) **	ULTSTP =	91.50
MODULUS OF ELASTICITY OF SHELL *****	E =	34000.00
CURVE FITTING PARAMETER *****	R =	2.00

DISTANCE FROM N.A. TO OUTSIDE FIBERS *	COYT =	2.00
DISTANCE FROM N.A. TO INSIDE FIBERS **	CIN =	12.00
MODULAR RATIO(UNCORR. TO CORR.) *****	PATMOD =	7.50

NUMBER OF MEMBERS *****	NM =	430
NUMBER OF NODES *****	NONES =	231
NUMBER OF EQUATIONS *****	NOES =	1155
HAND WIDTH *****	NHAND =	129
HALF HAND WIDTH PLUS DIAGONAL *****	NHS/H =	65
NUMBER OF SUPPORTS *****	NSUPS =	89
SMALLER NODE NUMBER ON END OF MEMBER *	NUMSF =	1
LARGER NODE NUMBER ON END OF MEMBER **	NUMSE =	13
THICKNESS OF SHELL (RHOING-WEAK AXIS)	THICKH =	1.28
CENTRAL ANGLE--DEGREES *****	CAN =	140.00
LENGTH OF LONGITUDINAL MEMBERS *****	SIJF =	36.00
RADIUS OF SHELL *****	RADII =	295.00

*****SHELL GEOMTRY*****
 NOOF X COORDINATE Y COORDINATE Z COORDINATE

1	-295.000	0.	.100
2	-295.000	36.000	.100
3	-295.000	72.000	.100
4	-295.000	108.000	.100
5	-295.000	144.000	.100
6	-295.000	180.000	.100
7	-295.000	216.000	.100
8	-295.000	252.000	.100
9	-295.000	288.000	.100
10	-295.000	324.000	.100
11	-295.000	360.000	.100
12	-291.364	0.	46.148
13	-291.364	36.000	46.148
14	-291.364	72.000	46.148
15	-291.364	108.000	46.148
16	-291.364	144.000	46.148
17	-291.364	180.000	46.148
18	-291.364	216.000	46.148
19	-291.364	252.000	46.148
20	-291.364	288.000	46.148
21	-291.364	324.000	46.148
22	-291.364	360.000	46.148
23	-240.562	0.	91.160
24	-240.562	36.000	91.160
25	-240.562	72.000	91.160
26	-240.562	108.000	91.160
27	-240.562	144.000	91.160
28	-240.562	180.000	91.160
29	-240.562	216.000	91.160
30	-240.562	252.000	91.160
31	-240.562	288.000	91.160
32	-240.562	324.000	91.160
33	-240.562	360.000	91.160
34	-262.447	0.	133.927
35	-262.447	36.000	133.927
36	-262.447	72.000	133.927
37	-262.447	108.000	133.927
38	-262.447	144.000	133.927
39	-262.447	180.000	133.927
40	-262.447	216.000	133.927
41	-262.447	252.000	133.927
42	-262.447	288.000	133.927
43	-262.447	324.000	133.927
44	-262.447	360.000	133.927
45	-234.660	0.	173.397
46	-234.660	36.000	173.397
47	-234.660	72.000	173.397
48	-234.660	108.000	173.397
49	-234.660	144.000	173.397
50	-234.660	180.000	173.397
51	-234.660	216.000	173.397
52	-234.660	252.000	173.397
53	-234.660	288.000	173.397
54	-234.660	324.000	173.397
55	-234.660	360.000	173.397
56	-204.597	0.	204.597
57	-204.597	36.000	204.597
58	-204.597	72.000	204.597
59	-204.597	108.000	204.597
60	-204.597	144.000	204.597

61	-204.597	180.000	208.597
62	-204.597	216.000	204.597
63	-204.597	252.000	208.597
64	-204.597	288.000	204.597
65	-204.597	324.000	204.597
66	-204.597	360.000	204.597
67	-173.397	0.	238.660
68	-173.397	36.000	238.660
69	-173.397	72.000	238.660
70	-173.397	108.000	238.660
71	-173.397	144.000	238.660
72	-173.397	180.000	238.660
73	-173.397	216.000	238.660
74	-173.397	252.000	238.660
75	-173.397	288.000	238.660
76	-173.397	324.000	238.660
77	-173.397	360.000	238.660
78	-133.927	0.	262.147
79	-133.927	36.000	262.147
80	-133.927	72.000	262.147
81	-133.927	108.000	262.147
82	-133.927	144.000	262.147
83	-133.927	180.000	262.147
84	-133.927	216.000	262.147
85	-133.927	252.000	262.147
86	-133.927	288.000	262.147
87	-133.927	324.000	262.147
88	-133.927	360.000	262.147
89	-91.160	0.	280.562
90	-91.160	36.000	280.562
91	-91.160	72.000	280.562
92	-91.160	108.000	280.562
93	-91.160	144.000	280.562
94	-91.160	180.000	280.562
95	-91.160	216.000	280.562
96	-91.160	252.000	280.562
97	-91.160	288.000	280.562
98	-91.160	324.000	280.562
99	-91.160	360.000	280.562
100	-46.144	0.	291.368
101	-46.144	36.000	291.368
102	-46.144	72.000	291.368
103	-46.144	108.000	291.368
104	-46.144	144.000	291.368
105	-46.144	180.000	291.368
106	-46.144	216.000	291.368
107	-46.144	252.000	291.368
108	-46.144	288.000	291.368
109	-46.144	324.000	291.368
110	-46.144	360.000	291.368
111	-0.000	0.	295.000
112	-0.000	36.000	295.000
113	-0.000	72.000	295.000
114	-0.000	108.000	295.000
115	-0.000	144.000	295.000
116	-0.000	180.000	295.000
117	-0.000	216.000	295.000
118	-0.000	252.000	295.000
119	-0.000	288.000	295.000
120	-0.000	324.000	295.000
121	-0.000	360.000	295.000
122	46.144	0.	291.368
123	46.144	36.000	291.368
124	46.144	72.000	291.368

125	46.149	108.000	291.169
126	46.149	144.000	291.169
127	46.149	180.000	291.169
128	46.149	216.000	291.169
129	46.149	252.000	291.169
130	46.149	288.000	291.169
131	46.149	324.000	291.169
132	46.149	360.000	291.169
133	91.160	0.	290.562
134	91.160	36.000	290.562
135	91.160	72.000	290.562
136	91.160	108.000	290.562
137	91.160	144.000	290.562
138	91.160	180.000	290.562
139	91.160	216.000	290.562
140	91.160	252.000	290.562
141	91.160	288.000	290.562
142	91.160	324.000	290.562
143	91.160	360.000	290.562
144	133.927	0.	262.147
145	133.927	36.000	262.147
146	133.927	72.000	262.147
147	133.927	108.000	262.147
148	133.927	144.000	262.147
149	133.927	180.000	262.147
150	133.927	216.000	262.147
151	133.927	252.000	262.147
152	133.927	288.000	262.147
153	133.927	324.000	262.147
154	133.927	360.000	262.147
155	173.397	0.	239.660
156	173.397	36.000	239.660
157	173.397	72.000	239.660
158	173.397	108.000	239.660
159	173.397	144.000	239.660
160	173.397	180.000	239.660
161	173.397	216.000	239.660
162	173.397	252.000	239.660
163	173.397	288.000	239.660
164	173.397	324.000	239.660
165	173.397	360.000	239.660
166	209.596	0.	209.597
167	209.596	36.000	209.597
168	209.596	72.000	209.597
169	209.596	108.000	209.597
170	209.596	144.000	209.597
171	209.596	180.000	209.597
172	209.596	216.000	209.597
173	209.596	252.000	209.597
174	209.596	288.000	209.597
175	209.596	324.000	209.597
176	209.596	360.000	209.597
177	239.660	0.	173.397
178	239.660	36.000	173.397
179	239.660	72.000	173.397
180	239.660	108.000	173.397
181	239.660	144.000	173.397
182	239.660	180.000	173.397
183	239.660	216.000	173.397
184	239.660	252.000	173.397
185	239.660	288.000	173.397
186	239.660	324.000	173.397
187	239.660	360.000	173.397
188	262.147	0.	133.927

189	262.447	36.000	133.327
190	262.447	72.000	133.327
191	262.447	108.000	133.327
192	262.447	144.000	133.327
193	262.447	180.000	133.327
194	262.447	216.000	133.327
195	262.447	252.000	133.327
196	262.447	288.000	133.327
197	262.447	324.000	133.327
198	262.447	360.000	133.327
199	290.562	0.	91.160
200	290.562	36.000	91.160
201	290.562	72.000	91.160
202	290.562	108.000	91.160
203	290.562	144.000	91.160
204	290.562	180.000	91.160
205	290.562	216.000	91.160
206	290.562	252.000	91.160
207	290.562	288.000	91.160
208	290.562	324.000	91.160
209	290.562	360.000	91.160
210	291.364	0.	46.144
211	291.364	36.000	46.144
212	291.364	72.000	46.144
213	291.364	108.000	46.144
214	291.364	144.000	46.144
215	291.364	180.000	46.144
216	291.364	216.000	46.144
217	291.364	252.000	46.144
218	291.364	288.000	46.144
219	291.364	324.000	46.144
220	291.364	360.000	46.144
221	295.000	0.	.000
222	295.000	36.000	.000
223	295.000	72.000	.000
224	295.000	108.000	.000
225	295.000	144.000	.000
226	295.000	180.000	.000
227	295.000	216.000	.000
228	295.000	252.000	.000
229	295.000	288.000	.000
230	295.000	324.000	.000
231	295.000	360.000	.000

[illegible]

[illegible]

106

```

***PERCENTAGE OF LOAD ON EACH RUNGE-KUTTA INTERVAL**
      .16671      .16670      .16670      .16670      .16670
      .16671

```

MN	JM	KH	ARFA	ULT.FORCE	SFC'10	ULT.MOM	LENGTH	HTYPE
1	1	2	.496	39.613	4.390	347.181	36.000	4
2	2	3	.496	39.613	4.390	347.181	36.000	4
3	3	4	.496	39.613	4.390	347.181	36.000	4
4	4	5	.496	39.613	4.390	347.181	36.000	4
5	5	6	.486	39.613	4.390	347.181	36.000	4
6	6	7	.496	39.613	4.390	347.181	36.000	4
7	7	8	.496	39.613	4.390	347.181	36.000	4
8	8	9	.496	39.613	4.390	347.181	36.000	4
9	9	10	.496	39.613	4.390	347.181	36.000	4
10	10	11	.496	39.613	4.390	347.181	36.000	4
11	11	12	.379	30.907	22.379	270.000	46.291	2
12	12	13	.010	10.000	.310	10.000	59.642	5
13	13	14	.010	10.000	.310	10.000	59.642	5
14	14	15	.756	61.614	45.759	540.000	46.291	1
15	15	16	.010	10.000	.310	10.000	59.642	5
16	16	17	.010	10.000	.310	10.000	59.642	5
17	17	18	.756	61.614	45.759	540.000	46.291	1
18	18	19	.010	10.000	.310	10.000	59.642	5
19	19	20	.010	10.000	.310	10.000	59.642	5
20	20	21	.756	61.614	45.759	540.000	46.291	1
21	21	22	.010	10.000	.310	10.000	59.642	5
22	22	23	.756	61.614	45.759	540.000	46.291	1
23	23	24	.010	10.000	.310	10.000	59.642	5
24	24	25	.010	10.000	.310	10.000	59.642	5
25	25	26	.756	61.614	45.759	540.000	46.291	1
26	26	27	.010	10.000	.310	10.000	59.642	5
27	27	28	.010	10.000	.310	10.000	59.642	5
28	28	29	.756	61.614	45.759	540.000	46.291	1
29	29	30	.010	10.000	.310	10.000	59.642	5
30	30	31	.010	10.000	.310	10.000	59.642	5
31	31	32	.756	61.614	45.759	540.000	46.291	1
32	32	33	.010	10.000	.310	10.000	59.642	5
33	33	34	.010	10.000	.310	10.000	59.642	5
34	34	35	.756	61.614	45.759	540.000	46.291	1
35	35	36	.010	10.000	.310	10.000	59.642	5
36	36	37	.010	10.000	.310	10.000	59.642	5
37	37	38	.756	61.614	45.759	540.000	46.291	1
38	38	39	.010	10.000	.310	10.000	59.642	5
39	39	40	.010	10.000	.310	10.000	59.642	5
40	40	41	.379	30.907	22.379	270.000	46.291	2
41	41	42	.972	79.227	8.180	694.363	36.000	3
42	42	43	.972	79.227	8.180	694.363	36.000	3
43	43	44	.972	79.227	8.180	694.363	36.000	3
44	44	45	.972	79.227	8.180	694.363	36.000	3
45	45	46	.972	79.227	8.180	694.363	36.000	3
46	46	47	.972	79.227	8.180	694.363	36.000	3
47	47	48	.972	79.227	8.180	694.363	36.000	3
48	48	49	.972	79.227	8.180	694.363	36.000	3
49	49	50	.972	79.227	8.180	694.363	36.000	3
50	50	51	.972	79.227	8.180	694.363	36.000	3
51	51	52	.379	30.907	22.379	270.000	46.291	2
52	52	53	.010	10.000	.310	10.000	59.642	5
53	53	54	.010	10.000	.310	10.000	59.642	5
54	54	55	.756	61.614	45.759	540.000	46.291	1
55	55	56	.010	10.000	.310	10.000	59.642	5
56	56	57	.010	10.000	.310	10.000	59.642	5
57	57	58	.756	61.614	45.759	540.000	46.291	1
58	58	59	.010	10.000	.310	10.000	59.642	5

60	15	25	.010	10.000	.710	10.000	54.642	1
61	15	26	.756	61.614	45.759	540.000	46.291	1
62	15	27	.010	10.000	.710	10.000	54.642	1
63	16	26	.010	10.000	.710	10.000	54.642	1
64	16	27	.756	61.614	45.759	540.000	46.291	1
65	16	28	.010	10.000	.710	10.000	54.642	1
66	17	27	.010	10.000	.710	10.000	54.642	1
67	17	28	.756	61.614	45.759	540.000	46.291	1
68	17	29	.010	10.000	.710	10.000	54.642	1
69	18	28	.010	10.000	.710	10.000	54.642	1
70	18	29	.756	61.614	45.759	540.000	46.291	1
71	18	30	.010	10.000	.710	10.000	54.642	1
72	19	29	.010	10.000	.710	10.000	54.642	1
73	19	30	.756	61.614	45.759	540.000	46.291	1
74	19	31	.010	10.000	.710	10.000	54.642	1
75	20	30	.010	10.000	.710	10.000	54.642	1
76	20	31	.756	61.614	45.759	540.000	46.291	1
77	20	32	.010	10.000	.710	10.000	54.642	1
78	21	31	.010	10.000	.710	10.000	54.642	1
79	21	32	.756	61.614	45.759	540.000	46.291	1
80	21	33	.010	10.000	.710	10.000	54.642	1
81	22	32	.010	10.000	.710	10.000	54.642	1
82	22	33	.778	30.807	22.379	270.000	46.291	2
83	23	24	.972	79.227	4.180	694.363	36.000	3
84	24	25	.972	79.227	4.180	694.363	36.000	3
85	25	26	.972	79.227	4.180	694.363	36.000	3
86	26	27	.972	79.227	4.180	694.363	36.000	3
87	27	28	.972	79.227	4.180	694.363	36.000	3
88	28	29	.972	79.227	4.180	694.363	36.000	3
89	29	30	.972	79.227	4.180	694.363	36.000	3
90	30	31	.972	79.227	4.180	694.363	36.000	3
91	31	32	.972	79.227	4.180	694.363	36.000	3
92	32	33	.972	79.227	4.180	694.363	36.000	3
93	33	34	.378	30.807	22.379	270.000	46.291	2
94	33	35	.010	10.000	.710	10.000	54.642	1
95	34	34	.010	10.000	.710	10.000	54.642	1
96	34	35	.756	61.614	45.759	540.000	46.291	1
97	34	36	.010	10.000	.710	10.000	54.642	1
98	35	35	.010	10.000	.710	10.000	54.642	1
99	35	36	.756	61.614	45.759	540.000	46.291	1
100	35	37	.010	10.000	.710	10.000	54.642	1
101	36	36	.010	10.000	.710	10.000	54.642	1
102	36	37	.756	61.614	45.759	540.000	46.291	1
103	36	38	.010	10.000	.710	10.000	54.642	1
104	37	37	.010	10.000	.710	10.000	54.642	1
105	37	38	.756	61.614	45.759	540.000	46.291	1
106	37	39	.010	10.000	.710	10.000	54.642	1
107	38	38	.010	10.000	.710	10.000	54.642	1
108	38	39	.756	61.614	45.759	540.000	46.291	1
109	38	40	.010	10.000	.710	10.000	54.642	1
110	39	39	.010	10.000	.710	10.000	54.642	1
111	39	40	.756	61.614	45.759	540.000	46.291	1
112	39	41	.010	10.000	.710	10.000	54.642	1
113	39	42	.010	10.000	.710	10.000	54.642	1
114	40	41	.756	61.614	45.759	540.000	46.291	1
115	40	42	.010	10.000	.710	10.000	54.642	1
116	41	41	.010	10.000	.710	10.000	54.642	1
117	41	42	.756	61.614	45.759	540.000	46.291	1
118	41	43	.010	10.000	.710	10.000	54.642	1
119	42	42	.010	10.000	.710	10.000	54.642	1
120	42	43	.756	61.614	45.759	540.000	46.291	1
121	42	44	.010	10.000	.710	10.000	54.642	1
122	43	43	.010	10.000	.710	10.000	54.642	1
123	43	44	.778	30.807	22.379	270.000	46.291	2

124	34	35	.972	79.227	9.180	694.363	36.770	3
125	35	36	.972	79.227	9.180	694.363	36.770	3
126	36	37	.972	79.227	9.180	694.363	36.770	3
127	37	38	.972	79.227	9.180	694.363	36.770	3
128	38	39	.972	79.227	9.180	694.363	36.770	3
129	39	40	.972	79.227	9.180	694.363	36.770	3
130	40	41	.972	79.227	9.180	694.363	36.770	3
131	41	42	.972	79.227	9.180	694.363	36.770	3
132	42	43	.972	79.227	9.180	694.363	36.770	3
133	43	44	.972	79.227	9.180	694.363	36.770	3
134	44	45	.378	70.807	22.379	270.000	46.291	2
135	45	46	.010	10.000	.710	10.000	51.642	5
136	46	47	.010	10.000	.710	10.000	51.642	5
137	47	48	.756	61.614	45.759	540.000	46.291	1
138	48	49	.010	10.000	.710	10.000	51.642	5
139	49	50	.010	10.000	.710	10.000	51.642	5
140	50	51	.756	61.614	45.759	540.000	46.291	1
141	51	52	.010	10.000	.710	10.000	51.642	5
142	52	53	.010	10.000	.710	10.000	51.642	5
143	53	54	.756	61.614	45.759	540.000	46.291	1
144	54	55	.010	10.000	.710	10.000	51.642	5
145	55	56	.010	10.000	.710	10.000	51.642	5
146	56	57	.756	61.614	45.759	540.000	46.291	1
147	57	58	.010	10.000	.710	10.000	51.642	5
148	58	59	.010	10.000	.710	10.000	51.642	5
149	59	60	.756	61.614	45.759	540.000	46.291	1
150	60	61	.010	10.000	.710	10.000	51.642	5
151	61	62	.010	10.000	.710	10.000	51.642	5
152	62	63	.756	61.614	45.759	540.000	46.291	1
153	63	64	.010	10.000	.710	10.000	51.642	5
154	64	65	.010	10.000	.710	10.000	51.642	5
155	65	66	.756	61.614	45.759	540.000	46.291	1
156	66	67	.010	10.000	.710	10.000	51.642	5
157	67	68	.010	10.000	.710	10.000	51.642	5
158	68	69	.756	61.614	45.759	540.000	46.291	1
159	69	70	.010	10.000	.710	10.000	51.642	5
160	70	71	.010	10.000	.710	10.000	51.642	5
161	71	72	.756	61.614	45.759	540.000	46.291	1
162	72	73	.010	10.000	.710	10.000	51.642	5
163	73	74	.010	10.000	.710	10.000	51.642	5
164	74	75	.756	61.614	45.759	540.000	46.291	1
165	75	76	.010	10.000	.710	10.000	51.642	5
166	76	77	.010	10.000	.710	10.000	51.642	5
167	77	78	.756	61.614	45.759	540.000	46.291	1
168	78	79	.010	10.000	.710	10.000	51.642	5
169	79	80	.010	10.000	.710	10.000	51.642	5
170	80	81	.756	61.614	45.759	540.000	46.291	1
171	81	82	.010	10.000	.710	10.000	51.642	5
172	82	83	.010	10.000	.710	10.000	51.642	5
173	83	84	.756	61.614	45.759	540.000	46.291	1
174	84	85	.010	10.000	.710	10.000	51.642	5
175	85	86	.010	10.000	.710	10.000	51.642	5
176	86	87	.756	61.614	45.759	540.000	46.291	1
177	87	88	.010	10.000	.710	10.000	51.642	5
178	88	89	.010	10.000	.710	10.000	51.642	5
179	89	90	.756	61.614	45.759	540.000	46.291	1
180	90	91	.010	10.000	.710	10.000	51.642	5
181	91	92	.010	10.000	.710	10.000	51.642	5
182	92	93	.756	61.614	45.759	540.000	46.291	1
183	93	94	.010	10.000	.710	10.000	51.642	5
184	94	95	.010	10.000	.710	10.000	51.642	5
185	95	96	.756	61.614	45.759	540.000	46.291	1
186	96	97	.010	10.000	.710	10.000	51.642	5
187	97	98	.010	10.000	.710	10.000	51.642	5
188	98	99	.756	61.614	45.759	540.000	46.291	1

188	49	61	.010	10.000	.110	10.000	54.042	1
189	50	60	.010	10.000	.110	10.000	54.042	1
190	50	61	.756	61.614	45.759	540.000	46.291	1
191	50	62	.010	10.000	.110	10.000	54.042	1
192	51	61	.010	10.000	.110	10.000	54.042	1
193	51	62	.756	61.614	45.759	540.000	46.291	1
194	51	63	.010	10.000	.110	10.000	54.042	1
195	52	62	.010	10.000	.110	10.000	54.042	1
196	52	63	.756	61.614	45.759	540.000	46.291	1
197	52	64	.010	10.000	.110	10.000	54.042	1
198	53	64	.010	10.000	.110	10.000	54.042	1
199	53	65	.756	61.614	45.759	540.000	46.291	1
200	53	66	.010	10.000	.110	10.000	54.042	1
201	54	64	.010	10.000	.110	10.000	54.042	1
202	54	65	.756	61.614	45.759	540.000	46.291	1
203	54	66	.010	10.000	.110	10.000	54.042	1
204	55	65	.010	10.000	.110	10.000	54.042	1
205	55	66	.378	30.907	22.379	270.000	46.291	2
206	56	57	.972	79.227	3.180	694.363	36.000	3
207	57	59	.972	79.227	3.180	694.363	36.000	3
208	58	59	.972	79.227	3.180	694.363	36.000	3
209	59	60	.972	79.227	3.180	694.363	36.000	3
210	60	61	.972	79.227	3.180	694.363	36.000	3
211	61	62	.972	79.227	3.180	694.363	36.000	3
212	62	63	.972	79.227	3.180	694.363	36.000	3
213	63	64	.972	79.227	3.180	694.363	36.000	3
214	64	65	.972	79.227	3.180	694.363	36.000	3
215	65	66	.972	79.227	3.180	694.363	36.000	3
216	56	67	.378	30.907	22.379	270.000	46.291	2
217	56	68	.010	10.000	.110	10.000	54.042	1
218	57	67	.010	10.000	.110	10.000	54.042	1
219	57	68	.756	61.614	45.759	540.000	46.291	1
220	57	69	.010	10.000	.110	10.000	54.042	1
221	58	69	.010	10.000	.110	10.000	54.042	1
222	58	70	.756	61.614	45.759	540.000	46.291	1
223	58	71	.010	10.000	.110	10.000	54.042	1
224	59	69	.010	10.000	.110	10.000	54.042	1
225	59	70	.756	61.614	45.759	540.000	46.291	1
226	59	71	.010	10.000	.110	10.000	54.042	1
227	60	70	.010	10.000	.110	10.000	54.042	1
228	60	71	.756	61.614	45.759	540.000	46.291	1
229	60	72	.010	10.000	.110	10.000	54.042	1
230	61	71	.010	10.000	.110	10.000	54.042	1
231	61	72	.756	61.614	45.759	540.000	46.291	1
232	61	73	.010	10.000	.110	10.000	54.042	1
233	62	72	.010	10.000	.110	10.000	54.042	1
234	62	73	.756	61.614	45.759	540.000	46.291	1
235	62	74	.010	10.000	.110	10.000	54.042	1
236	63	73	.010	10.000	.110	10.000	54.042	1
237	63	74	.756	61.614	45.759	540.000	46.291	1
238	63	75	.010	10.000	.110	10.000	54.042	1
239	64	74	.010	10.000	.110	10.000	54.042	1
240	64	75	.756	61.614	45.759	540.000	46.291	1
241	64	76	.010	10.000	.110	10.000	54.042	1
242	65	75	.010	10.000	.110	10.000	54.042	1
243	65	76	.756	61.614	45.759	540.000	46.291	1
244	65	77	.010	10.000	.110	10.000	54.042	1
245	66	76	.010	10.000	.110	10.000	54.042	1
246	66	77	.378	30.907	22.379	270.000	46.291	2
247	67	64	.972	79.227	3.180	694.363	36.000	3
248	68	69	.972	79.227	3.180	694.363	36.000	3
249	69	70	.972	79.227	3.180	694.363	36.000	3
250	70	71	.972	79.227	3.180	694.363	36.000	3
251	71	72	.972	79.227	3.180	694.363	36.000	3

252	72	73	.972	79.227	8.180	694.363	36.000	3
253	73	74	.972	79.227	8.180	694.363	36.000	3
254	74	75	.972	79.227	8.180	694.363	36.000	3
255	75	76	.972	79.227	8.180	694.363	36.000	3
256	76	77	.972	79.227	8.180	694.363	36.000	3
257	67	79	.378	30.907	22.179	270.000	46.291	2
258	67	79	.010	10.000	.110	10.000	59.642	5
259	68	79	.010	10.000	.110	10.000	59.642	5
260	68	79	.756	61.614	45.759	540.000	46.291	1
261	68	81	.010	10.000	.110	10.000	59.642	5
262	69	79	.010	10.000	.110	10.000	59.642	5
263	69	80	.756	61.614	45.759	540.000	46.291	1
264	69	81	.010	10.000	.110	10.000	59.642	5
265	70	80	.010	10.000	.110	10.000	59.642	5
266	70	81	.756	61.614	45.759	540.000	46.291	1
267	70	82	.010	10.000	.110	10.000	59.642	5
268	71	81	.010	10.000	.110	10.000	59.642	5
269	71	82	.756	61.614	45.759	540.000	46.291	1
270	71	83	.010	10.000	.110	10.000	59.642	5
271	72	82	.010	10.000	.110	10.000	59.642	5
272	72	83	.756	61.614	45.759	540.000	46.291	1
273	72	84	.010	10.000	.110	10.000	59.642	5
274	73	84	.010	10.000	.110	10.000	59.642	5
275	73	84	.756	61.614	45.759	540.000	46.291	1
276	73	85	.010	10.000	.110	10.000	59.642	5
277	74	84	.010	10.000	.110	10.000	59.642	5
278	74	85	.756	61.614	45.759	540.000	46.291	1
279	74	86	.010	10.000	.110	10.000	59.642	5
280	75	85	.010	10.000	.110	10.000	59.642	5
281	75	86	.756	61.614	45.759	540.000	46.291	1
282	75	87	.010	10.000	.110	10.000	59.642	5
283	76	86	.010	10.000	.110	10.000	59.642	5
284	76	87	.756	61.614	45.759	540.000	46.291	1
285	76	88	.010	10.000	.110	10.000	59.642	5
286	77	87	.010	10.000	.110	10.000	59.642	5
287	77	88	.378	30.907	22.179	270.000	46.291	2
288	78	79	.972	79.227	8.180	694.363	36.000	3
289	79	80	.972	79.227	8.180	694.363	36.000	3
290	80	81	.972	79.227	8.180	694.363	36.000	3
291	81	82	.972	79.227	8.180	694.363	36.000	3
292	82	83	.972	79.227	8.180	694.363	36.000	3
293	83	84	.972	79.227	8.180	694.363	36.000	3
294	84	85	.972	79.227	8.180	694.363	36.000	3
295	85	86	.972	79.227	8.180	694.363	36.000	3
296	86	87	.972	79.227	8.180	694.363	36.000	3
297	87	88	.972	79.227	8.180	694.363	36.000	3
298	88	89	.378	30.907	22.179	270.000	46.291	2
299	78	90	.010	10.000	.110	10.000	59.642	5
300	79	89	.010	10.000	.110	10.000	59.642	5
301	79	90	.756	61.614	45.759	540.000	46.291	1
302	79	91	.010	10.000	.110	10.000	59.642	5
303	80	90	.010	10.000	.110	10.000	59.642	5
304	80	91	.756	61.614	45.759	540.000	46.291	1
305	80	92	.010	10.000	.110	10.000	59.642	5
306	81	91	.010	10.000	.110	10.000	59.642	5
307	81	92	.756	61.614	45.759	540.000	46.291	1
308	81	93	.010	10.000	.110	10.000	59.642	5
309	82	92	.010	10.000	.110	10.000	59.642	5
310	82	93	.756	61.614	45.759	540.000	46.291	1
311	82	94	.010	10.000	.110	10.000	59.642	5
312	83	93	.010	10.000	.110	10.000	59.642	5
313	83	94	.756	61.614	45.759	540.000	46.291	1
314	83	95	.010	10.000	.110	10.000	59.642	5
315	84	94	.010	10.000	.110	10.000	59.642	5

316	84	95	.756	61.614	45.759	540.000	46.291	1
317	84	96	.010	10.000	.110	10.000	59.642	5
318	85	95	.010	10.000	.110	10.000	59.642	5
319	85	96	.756	61.614	45.759	540.000	46.291	1
320	85	97	.010	10.000	.110	10.000	59.642	5
321	86	95	.010	10.000	.110	10.000	59.642	5
322	86	97	.756	61.614	45.759	540.000	46.291	1
323	86	98	.010	10.000	.110	10.000	59.642	5
324	87	97	.010	10.000	.110	10.000	59.642	5
325	87	98	.756	61.614	45.759	540.000	46.291	1
326	87	99	.010	10.000	.110	10.000	59.642	5
327	88	98	.010	10.000	.110	10.000	59.642	5
328	88	99	.378	30.807	22.179	270.000	46.291	2
329	89	90	.972	79.227	9.180	694.363	36.000	3
330	90	91	.972	79.227	9.180	694.363	36.000	3
331	91	92	.972	79.227	9.180	694.363	36.000	3
332	92	93	.972	79.227	9.180	694.363	36.000	3
333	93	94	.972	79.227	9.180	694.363	36.000	3
334	94	95	.972	79.227	9.180	694.363	36.000	3
335	95	96	.972	79.227	9.180	694.363	36.000	3
336	96	97	.972	79.227	9.180	694.363	36.000	3
337	97	98	.972	79.227	9.180	694.363	36.000	3
338	98	99	.972	79.227	9.180	694.363	36.000	3
339	99	100	.378	30.807	22.179	270.000	46.291	2
340	99	101	.010	10.000	.110	10.000	59.642	5
341	90	101	.010	10.000	.110	10.000	59.642	5
342	90	102	.756	61.614	45.759	540.000	46.291	1
343	90	103	.010	10.000	.110	10.000	59.642	5
344	91	101	.010	10.000	.110	10.000	59.642	5
345	91	102	.756	61.614	45.759	540.000	46.291	1
346	91	103	.010	10.000	.110	10.000	59.642	5
347	92	102	.010	10.000	.110	10.000	59.642	5
348	92	103	.756	61.614	45.759	540.000	46.291	1
349	92	104	.010	10.000	.110	10.000	59.642	5
350	93	103	.010	10.000	.110	10.000	59.642	5
351	93	104	.756	61.614	45.759	540.000	46.291	1
352	93	105	.010	10.000	.110	10.000	59.642	5
353	94	104	.010	10.000	.110	10.000	59.642	5
354	94	105	.756	61.614	45.759	540.000	46.291	1
355	94	106	.010	10.000	.110	10.000	59.642	5
356	95	105	.010	10.000	.110	10.000	59.642	5
357	95	106	.756	61.614	45.759	540.000	46.291	1
358	95	107	.010	10.000	.110	10.000	59.642	5
359	96	105	.010	10.000	.110	10.000	59.642	5
360	96	107	.756	61.614	45.759	540.000	46.291	1
361	96	108	.010	10.000	.110	10.000	59.642	5
362	97	107	.010	10.000	.110	10.000	59.642	5
363	97	108	.756	61.614	45.759	540.000	46.291	1
364	97	109	.010	10.000	.110	10.000	59.642	5
365	98	108	.010	10.000	.110	10.000	59.642	5
366	98	109	.756	61.614	45.759	540.000	46.291	1
367	98	110	.010	10.000	.110	10.000	59.642	5
368	99	109	.010	10.000	.110	10.000	59.642	5
369	99	110	.378	30.807	22.179	270.000	46.291	2
370	100	101	.972	79.227	9.180	694.363	36.000	3
371	101	102	.972	79.227	9.180	694.363	36.000	3
372	102	103	.972	79.227	9.180	694.363	36.000	3
373	103	104	.972	79.227	9.180	694.363	36.000	3
374	104	105	.972	79.227	9.180	694.363	36.000	3
375	105	106	.972	79.227	9.180	694.363	36.000	3
376	106	107	.972	79.227	9.180	694.363	36.000	3
377	107	108	.972	79.227	9.180	694.363	36.000	3
378	108	109	.972	79.227	9.180	694.363	36.000	3
379	109	110	.972	79.227	9.180	694.363	36.000	3

3A0 100 111	.37A	30.907	22.479	270.000	46.291	2
3A1 100 112	.010	10.000	.110	10.000	59.642	5
3A2 101 111	.010	10.000	.110	10.000	59.642	5
3A3 101 112	.756	61.614	45.759	540.000	46.291	1
3A4 101 113	.010	10.000	.110	10.000	59.642	5
3A5 102 112	.010	10.000	.110	10.000	59.642	5
3A6 102 113	.756	61.614	45.759	540.000	46.291	1
3A7 102 114	.010	10.000	.110	10.000	59.642	5
3A8 103 113	.010	10.000	.110	10.000	59.642	5
3A9 103 114	.756	61.614	45.759	540.000	46.291	1
3A0 103 115	.010	10.000	.110	10.000	59.642	5
3A1 104 114	.010	10.000	.110	10.000	59.642	5
3A2 104 115	.756	61.614	45.759	540.000	46.291	1
3A3 104 116	.010	10.000	.110	10.000	59.642	5
3A4 105 115	.010	10.000	.110	10.000	59.642	5
3A5 105 116	.756	61.614	45.759	540.000	46.291	1
3A6 105 117	.010	10.000	.110	10.000	59.642	5
3A7 106 116	.010	10.000	.110	10.000	59.642	5
3A8 106 117	.756	61.614	45.759	540.000	46.291	1
3A9 106 118	.010	10.000	.110	10.000	59.642	5
400 107 117	.010	10.000	.110	10.000	59.642	5
401 107 118	.756	61.614	45.759	540.000	46.291	1
402 107 119	.010	10.000	.110	10.000	59.642	5
403 108 119	.010	10.000	.110	10.000	59.642	5
404 109 119	.756	61.614	45.759	540.000	46.291	1
405 109 120	.010	10.000	.110	10.000	59.642	5
406 109 121	.010	10.000	.110	10.000	59.642	5
407 109 122	.756	61.614	45.759	540.000	46.291	1
408 109 123	.010	10.000	.110	10.000	59.642	5
409 110 120	.010	10.000	.110	10.000	59.642	5
410 110 121	.37A	30.907	22.479	270.000	46.291	2
411 111 112	.972	79.227	9.180	694.363	36.000	3
412 112 113	.972	79.227	9.180	694.363	36.000	3
413 113 114	.972	79.227	9.180	694.363	36.000	3
414 114 115	.972	79.227	9.180	694.363	36.000	3
415 115 116	.972	79.227	9.180	694.363	36.000	3
416 116 117	.972	79.227	9.180	694.363	36.000	3
417 117 118	.972	79.227	9.180	694.363	36.000	3
418 118 119	.972	79.227	9.180	694.363	36.000	3
419 119 120	.972	79.227	9.180	694.363	36.000	3
420 120 121	.972	79.227	9.180	694.363	36.000	3
421 111 122	.37A	30.907	22.479	270.000	46.291	2
422 111 123	.010	10.000	.110	10.000	59.642	5
423 112 122	.010	10.000	.110	10.000	59.642	5
424 112 123	.756	61.614	45.759	540.000	46.291	1
425 112 124	.010	10.000	.110	10.000	59.642	5
426 113 123	.010	10.000	.110	10.000	59.642	5
427 113 124	.756	61.614	45.759	540.000	46.291	1
428 113 125	.010	10.000	.110	10.000	59.642	5
429 114 124	.010	10.000	.110	10.000	59.642	5
430 114 125	.756	61.614	45.759	540.000	46.291	1
431 114 126	.010	10.000	.110	10.000	59.642	5
432 115 125	.010	10.000	.110	10.000	59.642	5
433 115 126	.756	61.614	45.759	540.000	46.291	1
434 115 127	.010	10.000	.110	10.000	59.642	5
435 116 126	.010	10.000	.110	10.000	59.642	5
436 116 127	.756	61.614	45.759	540.000	46.291	1
437 116 128	.010	10.000	.110	10.000	59.642	5
438 117 127	.010	10.000	.110	10.000	59.642	5
439 117 128	.756	61.614	45.759	540.000	46.291	1
440 117 129	.010	10.000	.110	10.000	59.642	5
441 118 128	.010	10.000	.110	10.000	59.642	5
442 118 129	.756	61.614	45.759	540.000	46.291	1
443 118 130	.010	10.000	.110	10.000	59.642	5

444 119 129	.010	17.000	.710	10.000	59.642	5
445 119 131	.756	61.614	45.759	540.000	46.291	1
446 119 131	.710	10.000	.710	10.000	59.642	5
447 120 130	.010	10.000	.710	10.000	59.642	5
448 120 131	.756	61.614	45.759	540.000	46.291	1
449 120 132	.010	17.000	.710	10.000	59.642	5
450 121 131	.010	10.000	.710	10.000	59.642	5
451 121 132	.378	30.807	22.479	270.000	46.291	2
452 122 123	.972	79.227	9.180	694.363	36.000	3
453 123 124	.972	79.227	9.180	694.363	36.000	3
454 124 125	.972	79.227	9.180	694.363	36.000	3
455 125 125	.972	79.227	9.180	694.363	36.000	3
456 126 127	.972	79.227	9.180	694.363	36.000	3
457 127 129	.972	79.227	9.180	694.363	36.000	3
458 128 129	.972	79.227	9.180	694.363	36.000	3
459 129 130	.972	79.227	9.180	694.363	36.000	3
460 130 131	.972	79.227	9.180	694.363	36.000	3
461 131 132	.972	79.227	9.180	694.363	36.000	3
462 132 133	.378	30.807	22.479	270.000	46.291	2
463 133 134	.010	10.000	.710	10.000	59.642	5
464 134 135	.010	10.000	.710	10.000	59.642	5
465 135 136	.756	61.614	45.759	540.000	46.291	1
466 136 137	.010	10.000	.710	10.000	59.642	5
467 137 138	.010	10.000	.710	10.000	59.642	5
468 138 139	.756	61.614	45.759	540.000	46.291	1
469 139 140	.010	10.000	.710	10.000	59.642	5
470 140 141	.010	10.000	.710	10.000	59.642	5
471 141 142	.756	61.614	45.759	540.000	46.291	1
472 142 143	.010	10.000	.710	10.000	59.642	5
473 143 144	.010	10.000	.710	10.000	59.642	5
474 144 145	.756	61.614	45.759	540.000	46.291	1
475 145 146	.010	10.000	.710	10.000	59.642	5
476 146 147	.010	10.000	.710	10.000	59.642	5
477 147 148	.756	61.614	45.759	540.000	46.291	1
478 148 149	.010	10.000	.710	10.000	59.642	5
479 149 150	.010	10.000	.710	10.000	59.642	5
480 150 151	.756	61.614	45.759	540.000	46.291	1
481 151 152	.010	10.000	.710	10.000	59.642	5
482 152 153	.010	10.000	.710	10.000	59.642	5
483 153 154	.756	61.614	45.759	540.000	46.291	1
484 154 155	.010	10.000	.710	10.000	59.642	5
485 155 156	.010	10.000	.710	10.000	59.642	5
486 156 157	.756	61.614	45.759	540.000	46.291	1
487 157 158	.010	10.000	.710	10.000	59.642	5
488 158 159	.010	10.000	.710	10.000	59.642	5
489 159 160	.756	61.614	45.759	540.000	46.291	1
490 160 161	.010	10.000	.710	10.000	59.642	5
491 161 162	.010	10.000	.710	10.000	59.642	5
492 162 163	.756	61.614	45.759	540.000	46.291	1
493 163 164	.010	10.000	.710	10.000	59.642	5
494 164 165	.010	10.000	.710	10.000	59.642	5
495 165 166	.756	61.614	45.759	540.000	46.291	1
496 166 167	.010	10.000	.710	10.000	59.642	5
497 167 168	.010	10.000	.710	10.000	59.642	5
498 168 169	.756	61.614	45.759	540.000	46.291	1
499 169 170	.010	10.000	.710	10.000	59.642	5
500 170 171	.010	10.000	.710	10.000	59.642	5
501 171 172	.756	61.614	45.759	540.000	46.291	1
502 172 173	.010	10.000	.710	10.000	59.642	5
503 173 174	.010	10.000	.710	10.000	59.642	5
504 174 175	.756	61.614	45.759	540.000	46.291	1
505 175 176	.010	10.000	.710	10.000	59.642	5
506 176 177	.010	10.000	.710	10.000	59.642	5
507 177 178	.756	61.614	45.759	540.000	46.291	1
508 178 179	.010	10.000	.710	10.000	59.642	5
509 179 180	.010	10.000	.710	10.000	59.642	5
510 180 181	.756	61.614	45.759	540.000	46.291	1
511 181 182	.010	10.000	.710	10.000	59.642	5
512 182 183	.010	10.000	.710	10.000	59.642	5
513 183 184	.756	61.614	45.759	540.000	46.291	1
514 184 185	.010	10.000	.710	10.000	59.642	5
515 185 186	.010	10.000	.710	10.000	59.642	5
516 186 187	.756	61.614	45.759	540.000	46.291	1
517 187 188	.010	10.000	.710	10.000	59.642	5
518 188 189	.010	10.000	.710	10.000	59.642	5
519 189 190	.756	61.614	45.759	540.000	46.291	1
520 190 191	.010	10.000	.710	10.000	59.642	5
521 191 192	.010	10.000	.710	10.000	59.642	5
522 192 193	.756	61.614	45.759	540.000	46.291	1
523 193 194	.010	10.000	.710	10.000	59.642	5
524 194 195	.010	10.000	.710	10.000	59.642	5
525 195 196	.756	61.614	45.759	540.000	46.291	1
526 196 197	.010	10.000	.710	10.000	59.642	5
527 197 198	.010	10.000	.710	10.000	59.642	5
528 198 199	.756	61.614	45.759	540.000	46.291	1
529 199 200	.010	10.000	.710	10.000	59.642	5

508 135 145	.010	10.000	.010	10.000	58.642	5
509 135 146	.756	61.614	45.759	540.000	46.291	1
510 135 147	.010	10.000	.110	10.000	58.642	5
511 136 146	.010	10.000	.010	10.000	58.642	5
512 136 147	.756	61.614	45.759	540.000	46.291	1
513 136 148	.010	10.000	.110	10.000	58.642	5
514 137 147	.010	10.000	.110	10.000	58.642	5
515 137 148	.756	61.614	45.759	540.000	46.291	1
516 137 149	.010	10.000	.110	10.000	58.642	5
517 138 148	.010	10.000	.110	10.000	58.642	5
518 138 149	.756	61.614	45.759	540.000	46.291	1
519 138 150	.010	10.000	.110	10.000	58.642	5
520 139 149	.010	10.000	.110	10.000	58.642	5
521 139 150	.756	61.614	45.759	540.000	46.291	1
522 139 151	.010	10.000	.110	10.000	58.642	5
523 140 150	.010	10.000	.110	10.000	58.642	5
524 140 151	.756	61.614	45.759	540.000	46.291	1
525 140 152	.010	10.000	.110	10.000	58.642	5
526 141 151	.010	10.000	.110	10.000	58.642	5
527 141 152	.756	61.614	45.759	540.000	46.291	1
528 141 153	.010	10.000	.110	10.000	58.642	5
529 142 152	.010	10.000	.110	10.000	58.642	5
530 142 153	.756	61.614	45.759	540.000	46.291	1
531 142 154	.010	10.000	.110	10.000	58.642	5
532 143 153	.010	10.000	.110	10.000	58.642	5
533 143 154	.378	30.907	22.479	270.000	46.291	2
534 144 145	.972	79.227	8.180	694.363	36.000	3
535 145 146	.972	79.227	8.180	694.363	36.000	3
536 146 147	.972	79.227	8.180	694.363	36.000	3
537 147 148	.972	79.227	8.180	694.363	36.000	3
538 148 149	.972	79.227	8.180	694.363	36.000	3
539 149 150	.972	79.227	8.180	694.363	36.000	3
540 150 151	.972	79.227	8.180	694.363	36.000	3
541 151 152	.972	79.227	8.180	694.363	36.000	3
542 152 153	.972	79.227	8.180	694.363	36.000	3
543 153 154	.972	79.227	8.180	694.363	36.000	3
544 144 155	.378	30.907	22.479	270.000	46.291	2
545 144 156	.010	10.000	.110	10.000	58.642	5
546 145 155	.010	10.000	.110	10.000	58.642	5
547 145 156	.756	61.614	45.759	540.000	46.291	1
548 145 157	.010	10.000	.110	10.000	58.642	5
549 146 156	.010	10.000	.110	10.000	58.642	5
550 146 157	.756	61.614	45.759	540.000	46.291	1
551 146 158	.010	10.000	.110	10.000	58.642	5
552 147 157	.010	10.000	.110	10.000	58.642	5
553 147 158	.756	61.614	45.759	540.000	46.291	1
554 147 159	.010	10.000	.110	10.000	58.642	5
555 148 158	.010	10.000	.110	10.000	58.642	5
556 148 159	.756	61.614	45.759	540.000	46.291	1
557 148 160	.010	10.000	.110	10.000	58.642	5
558 149 159	.010	10.000	.110	10.000	58.642	5
559 149 160	.756	61.614	45.759	540.000	46.291	1
560 149 161	.010	10.000	.110	10.000	58.642	5
561 150 160	.010	10.000	.110	10.000	58.642	5
562 150 161	.756	61.614	45.759	540.000	46.291	1
563 150 162	.010	10.000	.110	10.000	58.642	5
564 151 161	.010	10.000	.110	10.000	58.642	5
565 151 162	.756	61.614	45.759	540.000	46.291	1
566 151 163	.010	10.000	.110	10.000	58.642	5
567 152 162	.010	10.000	.110	10.000	58.642	5
568 152 163	.756	61.614	45.759	540.000	46.291	1
569 152 164	.010	10.000	.110	10.000	58.642	5
570 153 163	.010	10.000	.110	10.000	58.642	5
571 153 164	.756	61.614	45.759	540.000	46.291	1

572 153 165	.010	11.000	.110	10.000	59.642	6
573 154 164	.010	10.000	.110	10.000	59.642	6
574 154 165	.174	30.807	22.179	270.000	46.291	2
575 155 156	.072	79.227	1.180	694.363	36.000	3
576 156 157	.072	79.227	1.180	694.363	36.000	3
577 157 158	.072	79.227	1.180	694.363	36.000	3
578 158 159	.072	79.227	1.180	694.363	36.000	3
579 159 160	.072	79.227	1.180	694.363	36.000	3
580 160 161	.072	79.227	1.180	694.363	36.000	3
581 161 162	.072	79.227	1.180	694.363	36.000	3
582 162 163	.072	79.227	1.180	694.363	36.000	3
583 163 164	.072	79.227	1.180	694.363	36.000	3
584 164 165	.072	79.227	1.180	694.363	36.000	3
585 155 166	.378	30.807	22.179	270.000	46.291	2
586 155 167	.010	10.000	.110	10.000	59.642	6
587 156 166	.010	10.000	.110	10.000	59.642	6
588 156 167	.756	61.614	45.759	540.000	46.291	1
589 156 168	.010	10.000	.110	10.000	59.642	6
590 157 167	.010	10.000	.110	10.000	59.642	6
591 157 168	.756	61.614	45.759	540.000	46.291	1
592 157 169	.010	10.000	.110	10.000	59.642	6
593 158 169	.010	10.000	.110	10.000	59.642	6
594 158 170	.756	61.614	45.759	540.000	46.291	1
595 158 171	.010	10.000	.110	10.000	59.642	6
596 159 169	.010	10.000	.110	10.000	59.642	6
597 159 170	.756	61.614	45.759	540.000	46.291	1
598 159 171	.010	10.000	.110	10.000	59.642	6
599 160 171	.010	10.000	.110	10.000	59.642	6
600 160 172	.756	61.614	45.759	540.000	46.291	1
601 161 172	.010	10.000	.110	10.000	59.642	6
602 161 173	.756	61.614	45.759	540.000	46.291	1
603 161 174	.010	10.000	.110	10.000	59.642	6
604 161 175	.010	10.000	.110	10.000	59.642	6
605 162 172	.010	10.000	.110	10.000	59.642	6
606 162 173	.756	61.614	45.759	540.000	46.291	1
607 162 174	.010	10.000	.110	10.000	59.642	6
608 163 174	.010	10.000	.110	10.000	59.642	6
609 163 175	.756	61.614	45.759	540.000	46.291	1
610 163 176	.010	10.000	.110	10.000	59.642	6
611 164 174	.010	10.000	.110	10.000	59.642	6
612 164 175	.756	61.614	45.759	540.000	46.291	1
613 164 176	.010	10.000	.110	10.000	59.642	6
614 165 175	.010	10.000	.110	10.000	59.642	6
615 165 176	.378	30.807	22.179	270.000	46.291	2
616 166 167	.072	79.227	1.180	694.363	36.000	3
617 167 168	.072	79.227	1.180	694.363	36.000	3
618 168 169	.072	79.227	1.180	694.363	36.000	3
619 169 170	.072	79.227	1.180	694.363	36.000	3
620 170 171	.072	79.227	1.180	694.363	36.000	3
621 171 172	.072	79.227	1.180	694.363	36.000	3
622 172 173	.072	79.227	1.180	694.363	36.000	3
623 173 174	.072	79.227	1.180	694.363	36.000	3
624 174 175	.072	79.227	1.180	694.363	36.000	3
625 175 176	.072	79.227	1.180	694.363	36.000	3
626 166 177	.378	30.807	22.179	270.000	46.291	2
627 166 178	.010	10.000	.110	10.000	59.642	6
628 167 177	.010	10.000	.110	10.000	59.642	6
629 167 178	.756	61.614	45.759	540.000	46.291	1
630 167 179	.010	10.000	.110	10.000	59.642	6
631 168 179	.756	61.614	45.759	540.000	46.291	1
632 168 180	.010	10.000	.110	10.000	59.642	6
633 168 181	.010	10.000	.110	10.000	59.642	6
634 169 179	.010	10.000	.110	10.000	59.642	6
635 169 180	.756	61.614	45.759	540.000	46.291	1

636 169 141	.010	10.000	.110	10.000	54.642	5
637 170 140	.010	10.000	.110	10.000	54.642	5
638 170 141	.756	61.614	45.759	540.000	46.291	1
639 170 142	.010	10.000	.010	10.000	54.642	5
640 171 141	.010	10.000	.010	10.000	54.642	5
641 171 142	.756	61.614	45.759	540.000	46.291	1
642 171 143	.010	10.000	.010	10.000	54.642	5
643 172 142	.010	10.000	.010	10.000	54.642	5
644 172 143	.756	61.614	45.759	540.000	46.291	1
645 172 144	.010	10.000	.010	10.000	54.642	5
646 173 143	.010	10.000	.010	10.000	54.642	5
647 173 144	.756	61.614	45.759	540.000	46.291	1
648 173 145	.010	10.000	.010	10.000	54.642	5
649 174 144	.010	10.000	.010	10.000	54.642	5
650 174 145	.756	61.614	45.759	540.000	46.291	1
651 174 146	.010	10.000	.010	10.000	54.642	5
652 175 145	.010	10.000	.010	10.000	54.642	5
653 175 146	.756	61.614	45.759	540.000	46.291	1
654 175 147	.010	10.000	.010	10.000	54.642	5
655 176 146	.010	10.000	.010	10.000	54.642	5
656 176 147	.756	61.614	45.759	540.000	46.291	1
657 177 147	.972	79.227	4.140	694.363	36.000	3
658 178 149	.972	79.227	4.140	694.363	36.000	3
659 179 140	.972	79.227	4.140	694.363	36.000	3
660 180 141	.972	79.227	4.140	694.363	36.000	3
661 181 142	.972	79.227	4.140	694.363	36.000	3
662 182 143	.972	79.227	4.140	694.363	36.000	3
663 183 144	.972	79.227	4.140	694.363	36.000	3
664 184 145	.972	79.227	4.140	694.363	36.000	3
665 185 146	.972	79.227	4.140	694.363	36.000	3
666 186 147	.972	79.227	4.140	694.363	36.000	3
667 177 144	.374	30.407	22.479	270.000	46.291	1
668 177 149	.010	10.000	.110	10.000	54.642	5
669 178 144	.010	10.000	.110	10.000	54.642	5
670 179 149	.756	61.614	45.759	540.000	46.291	1
671 174 140	.010	10.000	.010	10.000	54.642	5
672 179 149	.010	10.000	.010	10.000	54.642	5
673 179 140	.756	61.614	45.759	540.000	46.291	1
674 179 141	.010	10.000	.010	10.000	54.642	5
675 180 140	.010	10.000	.010	10.000	54.642	5
676 180 141	.756	61.614	45.759	540.000	46.291	1
677 180 142	.010	10.000	.010	10.000	54.642	5
678 181 141	.010	10.000	.010	10.000	54.642	5
679 181 142	.756	61.614	45.759	540.000	46.291	1
680 181 143	.010	10.000	.010	10.000	54.642	5
681 182 142	.010	10.000	.010	10.000	54.642	5
682 182 143	.756	61.614	45.759	540.000	46.291	1
683 182 144	.010	10.000	.010	10.000	54.642	5
684 183 143	.010	10.000	.010	10.000	54.642	5
685 183 144	.756	61.614	45.759	540.000	46.291	1
686 183 145	.010	10.000	.010	10.000	54.642	5
687 184 144	.010	10.000	.010	10.000	54.642	5
688 184 145	.756	61.614	45.759	540.000	46.291	1
689 184 146	.010	10.000	.010	10.000	54.642	5
690 185 145	.010	10.000	.010	10.000	54.642	5
691 185 146	.756	61.614	45.759	540.000	46.291	1
692 185 147	.010	10.000	.010	10.000	54.642	5
693 186 145	.010	10.000	.010	10.000	54.642	5
694 186 147	.756	61.614	45.759	540.000	46.291	1
695 186 144	.010	10.000	.010	10.000	54.642	5
696 187 147	.010	10.000	.010	10.000	54.642	5
697 187 144	.374	30.407	22.479	270.000	46.291	1
698 188 149	.972	79.227	4.140	694.363	36.000	3
699 189 190	.972	79.227	4.140	694.363	36.000	3

700 190 191	.972	79.227	8.180	694.363	36.000	3
701 191 192	.972	79.227	8.180	694.363	36.000	3
702 192 193	.972	79.227	8.180	694.363	36.000	3
703 193 194	.972	79.227	8.180	694.363	36.000	3
704 194 195	.972	79.227	8.180	694.363	36.000	3
705 195 196	.972	79.227	8.180	694.363	36.000	3
706 196 197	.972	79.227	8.180	694.363	36.000	3
707 197 198	.972	79.227	8.180	694.363	36.000	3
708 198 199	.972	30.807	22.179	270.000	46.291	2
709 199 200	.010	10.000	.010	10.000	58.642	5
710 199 200	.010	10.000	.010	10.000	58.642	5
711 199 200	.756	61.614	45.759	540.000	46.291	1
712 199 201	.010	10.000	.010	10.000	58.642	5
713 199 200	.010	10.000	.010	10.000	58.642	5
714 199 201	.756	61.614	45.759	540.000	46.291	1
715 199 202	.010	10.000	.010	10.000	58.642	5
716 199 201	.010	10.000	.010	10.000	58.642	5
717 199 202	.756	61.614	45.759	540.000	46.291	1
718 199 203	.010	10.000	.010	10.000	58.642	5
719 199 202	.010	10.000	.010	10.000	58.642	5
720 199 203	.756	61.614	45.759	540.000	46.291	1
721 199 204	.010	10.000	.010	10.000	58.642	5
722 199 203	.010	10.000	.010	10.000	58.642	5
723 199 204	.756	61.614	45.759	540.000	46.291	1
724 199 205	.010	10.000	.010	10.000	58.642	5
725 199 204	.010	10.000	.010	10.000	58.642	5
726 199 205	.756	61.614	45.759	540.000	46.291	1
727 199 206	.010	10.000	.010	10.000	58.642	5
728 199 205	.010	10.000	.010	10.000	58.642	5
729 199 206	.756	61.614	45.759	540.000	46.291	1
730 199 207	.010	10.000	.010	10.000	58.642	5
731 199 206	.010	10.000	.010	10.000	58.642	5
732 199 207	.756	61.614	45.759	540.000	46.291	1
733 199 208	.010	10.000	.010	10.000	58.642	5
734 199 207	.010	10.000	.010	10.000	58.642	5
735 199 208	.756	61.614	45.759	540.000	46.291	1
736 199 209	.010	10.000	.010	10.000	58.642	5
737 199 208	.010	10.000	.010	10.000	58.642	5
738 199 209	.378	30.807	22.179	270.000	46.291	2
739 199 200	.972	79.227	8.180	694.363	36.000	3
740 200 201	.972	79.227	8.180	694.363	36.000	3
741 201 202	.972	79.227	8.180	694.363	36.000	3
742 202 203	.972	79.227	8.180	694.363	36.000	3
743 203 204	.972	79.227	8.180	694.363	36.000	3
744 204 205	.972	79.227	8.180	694.363	36.000	3
745 205 206	.972	79.227	8.180	694.363	36.000	3
746 206 207	.972	79.227	8.180	694.363	36.000	3
747 207 208	.972	79.227	8.180	694.363	36.000	3
748 208 209	.972	79.227	8.180	694.363	36.000	3
749 199 210	.378	30.807	22.179	270.000	46.291	2
750 199 211	.010	10.000	.010	10.000	58.642	5
751 200 210	.010	10.000	.010	10.000	58.642	5
752 200 211	.756	61.614	45.759	540.000	46.291	1
753 200 212	.010	10.000	.010	10.000	58.642	5
754 201 211	.010	10.000	.010	10.000	58.642	5
755 201 212	.756	61.614	45.759	540.000	46.291	1
756 201 213	.010	10.000	.010	10.000	58.642	5
757 202 212	.010	10.000	.010	10.000	58.642	5
758 202 213	.756	61.614	45.759	540.000	46.291	1
759 202 214	.010	10.000	.010	10.000	58.642	5
760 203 213	.010	10.000	.010	10.000	58.642	5
761 203 214	.756	61.614	45.759	540.000	46.291	1
762 203 215	.010	10.000	.010	10.000	58.642	5
763 204 214	.010	10.000	.010	10.000	58.642	5

764 204 215	.756	61.614	45.759	540.000	46.291	1
765 204 216	.010	10.000	.010	10.000	58.642	5
766 205 215	.010	10.000	.110	10.000	58.642	5
767 205 216	.756	61.614	45.759	540.000	46.291	1
768 205 217	.010	10.000	.110	10.000	58.642	5
769 206 216	.010	10.000	.110	10.000	58.642	5
770 206 217	.756	61.614	45.759	540.000	46.291	1
771 206 218	.010	10.000	.110	10.000	58.642	5
772 207 217	.010	10.000	.110	10.000	58.642	5
773 207 218	.756	61.614	45.759	540.000	46.291	1
774 207 219	.010	10.000	.110	10.000	58.642	5
775 208 218	.010	10.000	.010	10.000	58.642	5
776 208 219	.756	61.614	45.759	540.000	46.291	1
777 208 220	.010	10.000	.110	10.000	58.642	5
778 209 219	.010	10.000	.110	10.000	58.642	5
779 209 220	.378	39.807	22.379	270.000	46.291	2
780 210 211	.972	79.227	8.180	694.363	36.000	3
781 211 212	.972	79.227	8.180	694.363	36.000	3
782 212 213	.972	79.227	8.180	694.363	36.000	3
783 213 214	.972	79.227	8.180	694.363	36.000	3
784 214 215	.972	79.227	8.180	694.363	36.000	3
785 215 216	.972	79.227	8.180	694.363	36.000	3
786 216 217	.972	79.227	8.180	694.363	36.000	3
787 217 218	.972	79.227	8.180	694.363	36.000	3
788 218 219	.972	79.227	8.180	694.363	36.000	3
789 219 220	.972	79.227	8.180	694.363	36.000	3
790 210 221	.378	39.807	22.379	270.000	46.291	2
791 210 222	.010	10.000	.110	10.000	58.642	5
792 211 221	.010	10.000	.010	10.000	58.642	5
793 211 222	.756	61.614	45.759	540.000	46.291	1
794 211 223	.010	10.000	.110	10.000	58.642	5
795 212 222	.010	10.000	.110	10.000	58.642	5
796 212 223	.756	61.614	45.759	540.000	46.291	1
797 212 224	.010	10.000	.010	10.000	58.642	5
798 213 223	.010	10.000	.010	10.000	58.642	5
799 213 224	.756	61.614	45.759	540.000	46.291	1
800 213 225	.010	10.000	.110	10.000	58.642	5
801 214 224	.010	10.000	.110	10.000	58.642	5
802 214 225	.756	61.614	45.759	540.000	46.291	1
803 214 226	.010	10.000	.010	10.000	58.642	5
804 215 225	.010	10.000	.010	10.000	58.642	5
805 215 226	.756	61.614	45.759	540.000	46.291	1
806 215 227	.010	10.000	.010	10.000	58.642	5
807 216 226	.010	10.000	.010	10.000	58.642	5
808 216 227	.756	61.614	45.759	540.000	46.291	1
809 216 228	.010	10.000	.110	10.000	58.642	5
810 217 227	.010	10.000	.110	10.000	58.642	5
811 217 228	.756	61.614	45.759	540.000	46.291	1
812 217 229	.010	10.000	.110	10.000	58.642	5
813 218 228	.010	10.000	.010	10.000	58.642	5
814 218 229	.756	61.614	45.759	540.000	46.291	1
815 218 230	.010	10.000	.110	10.000	58.642	5
816 219 229	.010	10.000	.010	10.000	58.642	5
817 219 230	.756	61.614	45.759	540.000	46.291	1
818 219 231	.010	10.000	.110	10.000	58.642	5
819 220 230	.010	10.000	.010	10.000	58.642	5
820 220 231	.378	39.807	22.379	270.000	46.291	2
821 221 222	.486	39.613	4.090	347.181	36.000	4
822 222 223	.486	39.613	4.090	347.181	36.000	4
823 223 224	.486	39.613	4.090	347.181	36.000	4
824 224 225	.486	39.613	4.090	347.181	36.000	4
825 225 226	.486	39.613	4.090	347.181	36.000	4
826 226 227	.486	39.613	4.090	347.181	36.000	4
827 227 228	.486	39.613	4.090	347.181	36.000	4
828 228 229	.486	39.613	4.090	347.181	36.000	4
829 229 230	.486	39.613	4.090	347.181	36.000	4
830 230 231	.486	39.613	4.090	347.181	36.000	4

PROBLEM NUMBER 5

THESE ARE THE ELASTIC NODAL DISPLACEMENTS

NODE	DELTA X	DELTA Y	DELTA Z	THETA X	THETA Y	THETA Z
1	0.	0.	0.	0.	-7.76342E-03	
2	0.	0.	0.	0.	-8.21076E-03	
3	0.	0.	0.	0.	-8.70662E-03	
4	0.	0.	0.	0.	-9.05075E-03	
5	0.	0.	0.	0.	-9.25902E-03	
6	0.	0.	0.	0.	-9.31237E-03	
7	0.	0.	0.	0.	-9.25914E-03	
8	0.	0.	0.	0.	-9.05965E-03	
9	0.	0.	0.	0.	-8.70595E-03	
10	0.	0.	0.	0.	-8.21240E-03	
11	0.	0.	0.	0.	-7.76411E-03	
12	-3.47230E-01	-4.27463E-04	2.09970E-02	4.64779E-05	-6.69057E-03	
13	-1.62242E-01	-1.81915E-04	2.26243E-02	4.33631E-05	-7.09611E-03	
14	-3.84183E-01	-7.14901E-04	2.40288E-02	3.39546E-05	-7.53015E-03	
15	-3.99365E-01	-2.27447E-04	2.50164E-02	2.05631E-05	-7.82772E-03	
16	-4.03493E-01	-1.26279E-04	2.55230E-02	8.55067E-06	-8.00359E-03	
17	-4.10829E-01	-1.81494E-05	2.56725E-02	-1.11059E-10	-8.04063E-03	
18	-4.04494E-01	8.99309E-05	2.55726E-02	-8.56729E-06	-8.04366E-03	
19	-3.99359E-01	1.91071E-04	2.50159E-02	2.05609E-05	-7.82764E-03	
20	-3.94150E-01	2.78445E-04	2.40292E-02	-3.38916E-05	-7.52956E-03	
21	-3.62304E-01	3.45494E-04	2.26275E-02	-4.32743E-05	-7.09816E-03	
22	-3.42264E-01	3.91475E-04	2.09034E-02	-4.63889E-05	-6.69149E-03	
23	-5.86044E-01	-6.19759E-04	7.30959E-02	1.51934E-04	-3.84476E-03	
24	-6.21417E-01	-5.64256E-04	7.85267E-02	1.48212E-04	-4.12357E-03	
25	-6.59906E-01	-4.71277E-04	8.34411E-02	1.18165E-04	-4.39020E-03	
26	-6.85937E-01	-7.44540E-04	8.68094E-02	7.01262E-05	-4.56117E-03	
27	-7.01291E-01	-1.95625E-04	8.85735E-02	2.95436E-05	-4.65330E-03	
28	-7.05196E-01	-3.61055E-05	8.90661E-02	-1.63765E-09	-4.67562E-03	
29	-7.01296E-01	1.23413E-04	8.85729E-02	-2.95875E-05	-4.65326E-03	
30	-6.85925E-01	2.72311E-04	8.64064E-02	-7.01934E-05	-4.56100E-03	
31	-6.59854E-01	3.94966E-04	8.34403E-02	-1.17870E-04	-4.38994E-03	
32	-6.21936E-01	4.91927E-04	7.85416E-02	-1.47834E-04	-4.12477E-03	
33	-5.86175E-01	5.47465E-04	7.31181E-02	-1.51824E-04	-3.84619E-03	
34	-6.72590E-01	-7.07043E-04	1.02116E-01	2.38900E-04	1.52299E-05	
35	-7.16052E-01	-6.43510E-04	1.10572E-01	2.26344E-04	-4.91220E-05	
36	-7.61966E-01	-5.39103E-04	1.17464E-01	1.69443E-04	-8.34009E-05	
37	-7.93651E-01	-3.96768E-04	1.22516E-01	9.24349E-05	-7.64420E-05	
38	-8.07782E-01	-2.30291E-04	1.24754E-01	3.58081E-05	-6.15593E-05	
39	-9.12001E-01	-5.26003E-05	1.25340E-01	-3.36255E-08	-5.24292E-05	
40	-8.07783E-01	1.25079E-04	1.24751E-01	-3.59183E-05	-6.14021E-05	
41	-7.90631E-01	2.91509E-04	1.22510E-01	-9.24892E-05	-7.62334E-05	
42	-7.61839E-01	4.33721E-04	1.17464E-01	-1.69803E-04	-8.34396E-05	
43	-7.16225E-01	5.38079E-04	1.10605E-01	-2.25504E-04	-5.02614E-05	
44	-6.72747E-01	5.97643E-04	1.02170E-01	-2.38355E-04	1.33727E-05	
45	-6.93699E-01	-6.54383E-04	4.66644E-02	1.82123E-04	4.11950E-03	
46	-6.34495E-01	-5.97939E-04	5.29560E-02	1.59360E-04	4.34055E-03	
47	-6.75786E-01	-5.00336E-04	5.75609E-02	8.99855E-05	4.56448E-03	
48	-7.01573E-01	-7.71049E-04	5.94833E-02	2.59065E-05	4.76852E-03	
49	-7.16191E-01	-2.22773E-04	5.98847E-02	8.81539E-07	4.88400E-03	
50	-7.19416E-01	-6.60475E-05	5.98302E-02	-1.19482E-07	4.92531E-03	
51	-7.16185E-01	9.05735E-05	5.98763E-02	-1.09941E-06	4.88424E-03	
52	-7.01545E-01	2.38768E-04	5.94709E-02	-2.58288E-05	4.76876E-03	
53	-6.75731E-01	3.67886E-04	5.75667E-02	-8.89050E-05	4.56834E-03	
54	-6.34715E-01	4.65405E-04	5.30149E-02	-1.57862E-04	4.33938E-03	
55	-5.93975E-01	5.21871E-04	4.67692E-02	-1.80961E-04	4.11736E-03	
56	-3.86356E-01	-4.64478E-04	-1.37658E-01	-1.56582E-04	7.71978E-03	
57	-4.14412E-01	-4.19250E-04	-1.43421E-01	-1.67553E-04	8.25568E-03	
58	-4.43462E-01	-3.48933E-04	-1.49948E-01	-1.95955E-04	8.73735E-03	

59	-4.59366F-01	-2.63406E-04	-1.56114E-01	-1.63556E-04	9.09A94C-03
60	-4.617A9E-01	-1.70458E-04	-1.61111E-01	-1.51333E-05	9.27946E-03
61	-4.70107F-01	-7.47475F-05	-1.62A71E-01	-2.61792E-07	9.34.17C-03
62	-4.61773E-01	2.09243E-05	-1.61198E-01	8.47625F-05	9.2A014C-03
63	-4.5932AE-01	1.17755F-04	-1.56A35E-01	1.63824E-04	9.09925E-03
64	-4.43417E-01	1.99067E-04	-1.49936E-01	1.97636E-04	8.73732C-03
65	-4.14676E-01	2.69260E-04	-1.41329E-01	1.69926E-04	8.25451C-03
66	-3.86664E-01	7.14504E-04	-1.374A6E-01	1.58719E-04	7.71760E-03
67	-1.17755E-01	-1.52349E-04	-4.59322E-01	-8.57003E-04	1.01344E-02
68	-1.266A7F-01	-1.25923E-04	-4.89735E-01	-8.20523E-04	1.09246E-02
69	-1.34476E-01	-1.01173E-04	-5.17392E-01	-6.99021E-04	1.16093C-02
70	-1.42524E-01	-1.66103E-05	-5.31517E-01	-4.53440E-04	1.20250C-02
71	-1.46141E-01	-7.95601E-05	-5.50945E-01	-2.07773E-04	1.22364E-02
72	-1.45525E-01	-7.67A94E-05	-5.54010E-01	-4.48662E-07	1.22913C-02
73	-1.46117E-01	-7.4071AE-05	-5.50074E-01	2.07185E-04	1.22367E-02
74	-1.42477F-01	-6.71714E-05	-5.3A621E-01	4.53A81E-04	1.20254E-02
75	-1.34415F-01	-5.23147E-05	-5.17371E-01	7.01406E-04	1.16094E-02
76	-1.26984F-01	-2.42819E-05	-4.89608E-01	8.273940E-04	1.094236C-02
77	-1.14126F-01	-1.40750E-06	-4.59076E-01	8.60227E-04	1.01325E-02
78	1.36422F-01	2.20049E-04	-8.81045E-01	-1.79240E-03	1.08131E-02
79	1.45707E-01	2.23505E-04	-9.45150E-01	-1.75664E-03	1.16113E-02
80	1.51294E-01	1.91227E-04	-1.00253E+00	-1.70425E-03	1.23896E-02
81	1.59663E-01	1.23170E-04	-1.03799E+00	-7.62077E-04	1.26437E-02
82	1.57651E-01	3.16196E-05	-1.05A00E+00	-3.35782E-04	1.29173C-02
83	1.54560E-01	-7.06991E-05	-1.06326E+00	-6.57037E-07	1.24633C-02
84	1.57690F-01	-1.730A1E-04	-1.05A44E+00	3.34912E-04	1.29176E-02
85	1.55720E-01	-2.64737E-04	-1.03A04E+00	7.62614E-04	1.26438C-02
86	1.51767F-01	-7.731A3E-04	-1.00252E+00	1.30775E-03	1.28899E-02
87	1.45373F-01	-3.65642E-04	-9.44992E-01	1.76113E-03	1.16106E-02
88	1.36010F-01	-3.62170E-04	-8.80730F-01	1.79675E-03	1.09096E-02
89	1.58A99E-01	5.37565E-04	-1.72120E+00	-2.51751E-03	9.34110E-03
90	3.74140F-01	5.21655E-04	-1.41330E+00	-2.63439E-03	9.72721E-03
91	3.50744F-01	4.40291E-04	-1.49915E+00	-1.75751E-03	1.01237C-02
92	1.57666E-01	3.02743E-04	-1.54125E+00	-9.93649E-04	1.02170E-02
93	3.67A14E-01	1.71273E-04	-1.57117E+00	-4.35796E-04	1.04049E-02
94	3.67640F-01	-5.54975E-05	-1.57410E+00	-8.35J35E-07	1.03650E-02
95	3.67A51F-01	-2.42337F-04	-1.57322E+00	4.34627F-04	1.04048E-02
96	3.57729E-01	-4.17995E-04	-1.54132E+00	9.94144E-04	1.02174E-02
97	3.50479F-01	-5.51A96F-04	-1.49915E+00	1.76125E-03	1.01241E-02
98	3.3791E-01	-6.33461E-04	-1.41312E+00	2.64375E-03	9.72192E-03
99	3.15461F-01	-6.49344E-04	-1.72046E+00	2.52251E-03	9.34044E-03
100	7.95901E-01	6.73790E-04	-1.66253E+00	-2.61115E-03	5.3567AE-03
101	4.124A0F-01	6.114A1E-04	-1.75764E+00	-2.69359F-03	5.08792C-03
102	4.24525F-01	5.19247E-04	-1.84553E+00	-1.85670E-03	4.7977AC-03
103	4.36AA7E-01	3.66724E-04	-1.89208E+00	-1.07621E-03	4.85293E-03
104	4.4319AF-01	1.76171E-04	-1.92526E+00	-4.82083E-04	4.76367C-03
105	4.43601E-01	-7.10551E-05	-1.92806E+00	-8.94100E-07	4.86442E-03
106	4.47234F-01	-2.78344E-04	-1.92532E+00	4.80716E-04	4.76366E-03
107	4.76951F-01	-4.28663E-04	-1.89208E+00	1.07647E-03	4.85309E-03
108	4.24637F-01	-5.41940E-04	-1.84555E+00	1.86057E-03	4.79823C-03
109	4.12116F-01	-6.74362E-04	-1.75747E+00	2.69929E-03	5.08821E-03
110	3.95474E-01	-6.9621AE-04	-1.66226E+00	2.61624E-03	5.3572AC-03
111	4.02463E-01	4.8395AE-04	-1.76360E+00	-2.01257E-03	-1.48510E-03
112	4.15037E-01	4.71A5AE-04	-1.83552E+00	-1.96441E-03	-2.1449AE-03
113	4.24703F-01	4.1071AE-04	-1.90064E+00	-1.54924E-03	-2.74320E-03
114	4.36924F-01	3.01103E-04	-1.94520E+00	-9.78649E-04	-2.90949E-03
115	4.42556E-01	1.5A559E-04	-1.97172E+00	-4.59343E-04	-3.07246E-03
116	4.43436F-01	0.	-1.97900E+00	-7.59791E-07	-3.01907E-03
117	4.42592E-01	-1.56720E-04	-1.97177E+00	4.58049E-04	-3.07277E-03
118	4.369A6F-01	-2.97991E-04	-1.94528E+00	9.78522C-04	-2.91018E-03
119	4.284A0E-01	-4.07095E-04	-1.90067E+00	1.55263F-03	-2.74292E-03
120	4.14656E-01	-4.67859E-04	-1.83537E+00	1.96966E-03	-2.14336E-03
121	4.07044E-01	-4.79755E-04	-1.76329F+00	2.01709C-03	-1.48341E-03
122	4.17192F-01	2.44724E-04	-1.528A1E+00	-1.11969E-03	-1.11412E-03

123	4.32315E-01	2.52266E-04	-1.56849E+00	-1.09471F-03	-8.77743E-03
124	4.47533F-01	2.41619E-04	-1.60697E+00	-9.94642E-04	-9.33303E-03
125	4.56725E-01	2.05440E-04	-1.63470E+00	-7.24331E-04	-4.67493E-03
126	4.62779F-01	1.59477E-04	-1.65414F+00	-3.67899E-04	-9.47401E-03
127	4.63742F-01	1.70352E-05	-1.65506E+00	-4.72715E-07	-9.44501E-03
128	4.62416E-01	2.60433E-05	-1.65417E+00	3.67045E-04	-9.4451E-03
129	4.56747E-01	-2.01916E-05	-1.63476E+00	7.23852E-04	-9.67974E-03
130	4.47700E-01	-4.04445E-05	-1.60701E+00	1.00058E-03	-9.33301E-03
131	4.31903E-01	-1.14005E-04	-1.56441F+00	1.10233E-03	-4.77610E-03
132	4.14769E-01	-1.13492E-04	-1.52459E+00	1.12345E-03	-4.11161E-03
133	5.24902E-01	-4.97642E-04	-1.07603E+00	-3.66674E-04	-1.14453E-02
134	5.42415E-01	-4.73649E-04	-1.08966E+00	-4.01093E-04	-1.19293E-02
135	5.62962F-01	-4.49639E-04	-1.10513E+00	-4.53224E-04	-1.23645E-02
136	5.75474F-01	-4.34633E-04	-1.12105E+00	-4.01904E-04	-1.27004E-02
137	5.43675E-01	-4.30543E-04	-1.13263E+00	-2.30927E-04	-1.24427E-02
138	5.45365E-01	-4.34533E-04	-1.13696E+00	-1.13720E-07	-1.24461E-02
139	5.43717E-01	-4.41329E-04	-1.13264E+00	2.30591E-04	-1.26833E-02
140	5.75442F-01	-4.45646E-04	-1.12106E+00	4.01914E-04	-1.27013E-02
141	5.62946E-01	-4.44404E-04	-1.10513E+00	4.53760E-04	-1.23645E-02
142	5.47224E-01	-4.99191E-04	-1.04963E+00	4.07447E-04	-1.19273E-02
143	5.24444F-01	-4.71679E-04	-1.07594E+00	3.66721E-04	-1.14423E-02
144	7.31341F-01	-6.72701E-04	-5.66987E-01	9.44755E-05	-1.14364E-02
145	7.55056F-01	-6.34129F-04	-5.64007E-01	5.04752E-05	-1.21133E-02
146	7.41209E-01	-5.77073E-04	-5.63943E-01	-5.14447E-05	-1.23432E-02
147	7.49274E-01	-5.09490E-04	-5.67277E-01	-1.16065E-04	-1.26404E-02
148	4.10043F-01	-4.34940E-04	-5.71267E-01	-9.00466E-05	-1.24026E-02
149	4.12492F-01	-3.67166E-04	-5.72492E-01	2.05167F-07	-1.24594E-02
150	4.10177F-01	-2.95437F-04	-5.71244F-01	9.03679E-05	-1.24030E-02
151	7.49475F-01	-2.24542E-04	-5.67259F-01	1.15916E-04	-1.26404E-02
152	7.41215E-01	-1.57604E-04	-5.63944E-01	5.04325E-05	-1.23432E-02
153	7.54459F-01	-1.00817E-04	-5.64054E-01	-5.15452E-05	-1.21114E-02
154	7.30464F-01	-6.25553E-05	-5.67027E-01	-9.74735E-05	-1.14433E-02
155	9.49274E-01	-7.25143E-04	-1.30062E-01	3.06077E-04	-9.42056E-03
156	1.02044E+00	-6.74116E-04	-1.19464F-01	2.64908E-04	-1.14364E-02
157	1.05164F+00	-6.43714E-04	-1.11355E-01	1.73946E-04	-1.04464E-02
158	1.07437F+00	-5.49234F-04	-1.07011E-01	7.31350E-05	-1.04434E-02
159	1.04434F+00	-3.49667E-04	-1.05574E-01	1.59016E-05	-1.02402E-02
160	1.04240F+00	-2.45069E-04	-1.05369E-01	4.07459E-07	-1.03305E-02
161	1.04444F+00	-1.70405F-04	-1.05547E-01	-1.53414E-05	-1.02974E-02
162	1.07446E+00	-6.16464F-05	-1.06940E-01	-7.36099E-05	-1.01440E-02
163	1.05167F+00	3.41204E-05	-1.11372E-01	-1.76196E-04	-1.00455E-02
164	1.02027E+00	1.04547E-04	-1.19573E-01	-2.71743F-04	-9.41447E-03
165	9.42640E-01	1.55460F-04	-1.30202E-01	-3.06542F-04	-9.81445E-03
166	1.23094E+00	-7.06557E-04	1.57041F-01	3.32409E-04	-6.04791E-03
167	1.25921E+00	-6.55401E-04	1.64454E-01	3.14960E-04	-6.01309E-03
168	1.24169F+00	-5.75524E-04	1.79143F-01	2.50450E-04	-6.01234E-03
169	1.31692E+00	-4.69156E-04	1.46544F-01	1.57473E-04	-6.04645E-03
170	1.33307E+00	-3.44679E-04	1.40544E-01	7.06956E-05	-6.04645E-03
171	1.33794E+00	-2.11099E-04	1.91819E-01	4.39909E-07	-6.04645E-03
172	1.33313F+00	-7.74342E-05	1.90616E-01	-7.01412E-05	-6.04645E-03
173	1.31700F+00	4.72665E-05	1.46564E-01	-1.54111E-04	-6.04645E-03
174	1.29166F+00	1.53966E-04	1.79157E-01	-2.52915E-04	-6.01214E-03
175	1.25446F+00	2.34318E-04	1.64729F-01	-3.17329F-04	-6.01311E-03
176	1.23033E+00	2.44494E-04	1.56896E-01	-3.33722E-04	-6.04729E-03
177	1.35716E+00	-6.35430E-04	2.73032E-01	2.59206E-04	-1.24113E-03
178	1.34247E+00	-5.45116E-04	2.42375E-01	2.58590E-04	-1.2006E-03
179	1.41316F+00	-5.07630E-04	2.91279F-01	2.27754E-04	-1.02777E-03
180	1.44403E+00	-4.04001F-04	2.44325E-01	1.60342F-04	-9.76645E-04
181	1.45445E+00	-2.41165E-04	3.02663E-01	7.99566E-05	-9.55654E-04
182	1.45461E+00	-1.44291E-04	3.04044F-01	3.44144E-07	-9.51636E-04
183	1.45450E+00	-1.53364E-05	3.02645E-01	-7.95216E-05	-9.55379E-04
184	1.44410F+00	1.07732E-04	2.94347F-01	-1.60942E-04	-9.76346E-04
185	1.41312E+00	2.11647E-04	2.91253E-01	-2.29449E-04	-1.02777E-03
186	1.34184F+00	2.49264E-04	2.42256E-01	-2.60403E-04	-1.12046E-03

187	1.75651E+00	7.39912E-04	2.72757E-01	-2.60464E-04	-1.24221E-03
188	1.30227E+00	-5.31373E-04	2.46978E-01	1.56152E-04	3.87466E-03
189	1.32147E+00	-4.87451E-04	2.52641E-01	1.64900E-04	3.99511E-03
190	1.34764E+00	-4.14616E-04	2.58604E-01	1.56983E-04	4.14657E-03
191	1.36914E+00	-3.23742E-04	2.63590E-01	1.16867E-04	4.26057E-03
192	1.39377E+00	-2.15008E-04	2.66822E-01	6.08401E-05	4.32954E-03
193	1.39441E+00	-9.75705E-05	2.67912E-01	2.05224E-07	4.35126E-03
194	1.39341E+00	1.99357E-05	2.66935E-01	-6.05620E-05	4.32995E-03
195	1.36924E+00	1.29471E-04	2.63604E-01	-1.17209E-04	4.26095E-03
196	1.34760E+00	2.20037E-04	2.59544E-01	-1.59651E-04	4.14624E-03
197	1.32134E+00	2.89954E-04	2.52591E-01	-1.66523E-04	3.99309E-03
198	1.30163E+00	7.36806E-04	2.46411E-01	-1.56892E-04	3.83177E-03
199	1.07495E+00	-4.09239E-04	1.43247E-01	7.05449E-05	8.39554E-03
200	1.04773E+00	-3.65823E-04	1.45891E-01	7.83696E-05	8.55632E-03
201	1.06621E+00	-7.08897E-04	1.48798E-01	7.88673E-05	8.74235E-03
202	1.03194E+00	-2.35807E-04	1.51379E-01	6.05532E-05	8.89647E-03
203	1.07282E+00	-1.50245E-04	1.53034E-01	3.22208E-05	8.99912E-03
204	1.07627E+00	-5.79315E-05	1.53612E-01	9.19955E-08	9.03227E-03
205	1.09244E+00	7.44247E-05	1.53040E-01	-3.20465E-05	8.99947E-03
206	1.04194E+00	1.20137E-04	1.51746E-01	-6.07055E-05	8.89731E-03
207	1.06614E+00	1.97436E-04	1.49787E-01	-7.97610E-05	8.74196E-03
208	1.04737E+00	2.50429E-04	1.45843E-01	-7.92211E-05	8.55267E-03
209	1.03453E+00	2.97773E-04	1.43181E-01	-7.09437E-05	8.39154E-03
210	5.75404E-01	-2.76119E-04	3.94507E-02	2.04326E-05	1.16600E-02
211	5.81894E-01	-2.78311E-04	4.02011E-02	2.14187E-05	1.17994E-02
212	5.91445E-01	-1.95214E-04	4.09761E-02	2.11334E-05	1.20045E-02
213	5.99745E-01	-1.44271E-04	4.16745E-02	1.67880E-05	1.21737E-02
214	6.05537E-01	-8.71630E-05	4.21425E-02	8.49176E-06	1.23011E-02
215	6.07361E-01	-2.66904E-05	4.23070E-02	2.75433E-04	1.23197E-02
216	6.05544E-01	3.39039E-05	4.21443E-02	-8.95026E-06	1.23014E-02
217	5.99766E-01	9.09864E-05	4.16767E-02	-1.68574E-05	1.21891E-02
218	5.91476E-01	1.42064E-04	4.09724E-02	-2.13969E-05	1.20043E-02
219	5.81679E-01	1.95174E-04	4.01494E-02	-2.16174E-05	1.17952E-02
220	5.75581E-01	2.22920E-04	3.94326E-02	-2.05719E-05	1.16592E-02
221	0.	0.	0.	0.	1.24712E-02
222	0.	0.	0.	0.	1.29946E-02
223	0.	0.	0.	0.	1.32097E-02
224	0.	0.	0.	0.	1.33907E-02
225	0.	0.	0.	0.	1.35179E-02
226	0.	0.	0.	0.	1.35578E-02
227	0.	0.	0.	0.	1.35130E-02
228	0.	0.	0.	0.	1.33907E-02
229	0.	0.	0.	0.	1.32090E-02
230	0.	0.	0.	0.	1.29935E-02
231	0.	0.	0.	0.	1.28662E-02

THESE ARE THE PLASTIC FORCES

MEMBER NO.	MOM. AT J END	MOM. AT K END	SHEAR	AXIAL
1	0.	0.	0.	0.
2	0.	0.	0.	0.
3	0.	0.	0.	0.
4	0.	0.	0.	0.
5	0.	0.	0.	0.
6	0.	0.	0.	0.
7	0.	0.	0.	0.
8	0.	0.	0.	0.
9	0.	0.	0.	0.

10	0.	0.	0.	0.
11	1.24017E-04	-3.1A159E+01	-6.87307E-01	1.45237E+00
12	-1.23550E-03	9.42302E-04	3.79901E-05	2.48912E-02
13	-2.51110E-03	4.76476E-04	5.09463E-05	2.25985E-02
14	3.69572E-04	-6.60A15F+01	-1.42754E+00	2.87436E+00
15	-1.17071E-03	8.17153E-04	3.3A985E-05	2.59777E-02
16	-2.60305E-03	5.08293E-04	5.30569F-05	2.24973E-02
17	4.86555E-04	-6.97776E+01	-1.50738E+00	3.03171E+00
18	-1.44721E-03	7.53941E-04	3.75356E-05	2.65361E-02
19	-2.46249E-03	5.55132E-04	5.14587E-05	2.39998E-02
20	4.19118E-04	-7.25361E+01	-1.56697E+00	3.13278E+00
21	-1.71292E-03	7.24499E-04	4.15646E-05	2.79725E-02
22	-2.34965E-03	5.70383E-04	5.14998E-05	2.51075E-02
23	4.36540E-04	-7.44607E+01	-1.60A55F+00	3.23643E+00
24	-1.99933E-03	7.56219E-04	4.69496E-05	2.61713E-02
25	-2.17957E-03	7.44417E-04	4.99302E-05	2.62797E-02
26	4.36043E-04	-7.49517E+01	-1.61915E+00	3.25318E+00
27	-2.16445E-03	7.33192E-04	4.94127E-05	2.63964E-02
28	-2.01444E-03	7.71251E-04	4.75043F-05	2.67570E-02
29	4.36626E-04	-7.44635E+01	-1.60861E+00	3.23672E+00
30	-2.33515E-03	6.55A54E-04	5.10081E-05	2.52233E-02
31	-1.72773E-03	7.39660E-04	4.20757E-05	2.69606E-02
32	4.19213E-04	-7.25375E+01	-1.56700E+00	3.13798E+00
33	-2.444A63E-03	5.41411E-04	5.094A3F-05	2.41021E-02
34	-1.460A6E-03	7.6A226E-04	3.80119E-05	2.64235E-02
35	4.06122E-04	-6.97668E+01	-1.50715F+00	3.03025E+00
36	-2.5850A8E-03	4.93416E-04	5.24964E-05	2.26144E-02
37	-1.18859E-03	9.32306E-04	3.44614E-05	2.51513E-02
38	3.70000E-04	-6.66868E+01	-1.42765E+00	2.87529E+00
39	-2.49749E-03	4.63230E-04	5.04A83E-05	2.26997E-02
40	-1.24A57E-03	1.90515E-03	3.94321E-05	2.47445E-02
41	1.25329F-04	-3.1A0A9F+01	-6.87155E-01	1.45148E+00
42	1.63674E-03	-4.41015E-02	-1.77051F-03	-3.77274E-02
43	4.95360E-02	-7.87333E-02	-8.11016E-04	-5.42871E-02
44	-8.37743E-02	-8.87977E-02	-4.17315F-04	-7.08A62E-02
45	-1.02121E-01	-6.16449F-02	1.12422E-03	-8.20173E-02
46	-6.32742F-02	-5.33011F-02	2.77030F-04	-8.75037F-02
47	-5.3302E-02	-6.34692F-02	-2.41639E-04	-8.75073F-02
48	-6.19001F-02	-1.01613E-01	-1.10313F-03	-8.75019F-02
49	-9.43362F-02	-9.34061F-02	4.14725E-04	-7.04124E-02
50	-7.14318E-02	-4.94A63E-02	9.04043F-04	-9.42869F-02
51	-4.41167F-02	1.65402F-03	1.27141F-03	-3.77452F-02
52	-3.1A152E+01	-5.257A2E+01	-4.4A532E-01	1.530A8E+00
53	-2.203A5E-03	-4.35037E-03	-3.66039F-05	3.80555E-02
54	-8.02973F-03	-2.60059E-03	9.25816F-05	1.20514F-02
55	-6.607A5E+01	-1.10766E+02	-9.54560E-01	3.05608E+00
56	-1.452A4E-03	-5.37596F-03	-6.007A7E-05	4.20A43E-02
57	-8.67707E-03	-2.46351E-03	1.0595A8E-04	9.23801E-03
58	-6.97741E+01	-1.16458E+02	-1.00849E+00	3.23147E+00
59	-3.14163E-03	-5.23754E-03	-3.57410E-05	3.80423E-02
60	-7.90379E-03	-3.26516E-03	7.73A90E-05	1.54362E-02
61	-7.25325F+01	-1.21212E+02	-1.05159E+00	3.33833E+00
62	-4.2468A8E-03	-5.00326F-03	-1.24985E-05	3.49635E-02
63	-7.12442E-03	-3.60535E-03	6.00096E-05	2.02123E-02
64	-7.44570F+01	-1.74251F+02	-1.07568F+00	3.45108E+00
65	-5.45237E-03	-4.42112E-03	1.75857E-05	2.99100E-02
66	-6.16444E-03	-4.112A9E-03	3.49946E-05	2.62735E-02
67	-7.494A0E+01	-1.25107E+02	-1.08356F+00	3.46721E+00
68	-6.1496A8E-03	-4.12A20E-03	3.44717E-05	2.63936E-02
69	-5.46737F-03	-4.40645E-03	1.80917E-05	2.97922E-02
70	-7.44598E+01	-1.24255E+02	-1.07570E+00	3.45136E+00
71	-7.11237E-03	-3.61A60E-03	5.957A3E-05	2.03200E-02
72	-4.25A55E-03	-4.99057E-03	-1.24778E-05	3.44603E-02
73	-7.25379E+01	-1.21213E+02	-1.05159E+00	3.33959E+00

74	-7.79649F-03	-7.76945E-03	7.71943F-05	1.55059C-02
75	-7.14956E-03	-5.72712F-03	-3.54280F-05	3.79629F-02
76	-6.97633E+01	-1.16447E+02	-1.00469F+00	3.22987F+00
77	-8.94574E-03	-2.48690E-03	1.95014E-04	9.44119E-03
78	-1.14427E-03	-5.35120F-03	-5.91207F-05	4.14764F-02
79	-6.60874E+01	-1.10770F+02	-9.54524F-01	3.05714E+00
80	-9.12214F-03	-2.60772F-03	9.23307F-05	1.71102C-02
81	-2.70814F-03	-4.74809E-03	-3.64910E-05	7.79927E-02
82	-7.14042F+01	-5.25701E+01	-4.44510F-01	1.57009F+00
83	6.51579E-03	-5.73169E-02	-1.77317E-03	-4.44622F-02
84	-6.99275F-02	-7.40704E-01	-7.54974E-03	-7.53219E-02
85	-3.51245E-01	-7.03690E-01	1.72094F-03	-1.02664F-01
86	-3.10669F-01	-2.42604F-01	1.99060E-03	-1.20635E-01
87	-2.45977E-01	-1.56424F-01	2.47647E-03	-1.29725F-01
88	-1.56844F-01	-2.46505F-01	-2.49143F-03	-1.29222E-01
89	-2.43141E-01	-7.10414E-01	-1.96759E-03	-1.27020E-01
90	-3.03467F-01	-3.46521E-01	-1.19194E-03	-1.72602E-01
91	-3.36044E-01	-7.24650F-02	7.32175E-03	-7.57067E-02
92	-6.99194F-02	6.52340F-03	1.47143E-03	-4.49913E-02
93	-5.25719E+01	-6.14979E+01	-2.01244E-01	1.54516E+00
94	-4.48591E-03	-1.19776E-02	-1.27757E-04	6.11634E-02
95	-1.53149F-02	-4.21358E-03	1.39104F-04	-3.97436E-03
96	-1.10259F+02	-1.71399E+02	-4.56667F-01	3.16413E+00
97	-4.34447F-03	-1.36674E-02	-1.58225E-04	6.40975E-02
98	-1.55191E-02	-4.04463E-03	2.12041E-04	-1.49950E-02
99	-1.16450E+02	-1.38949E+02	-4.86906E-01	7.75365E+00
100	-7.12372E-03	-1.26997F-02	-9.67901E-05	5.60134E-02
101	-1.50547F-02	-6.04512F-03	1.52956F-04	-6.30466E-04
102	-1.21206C+02	-1.44744F+02	-5.09490F-01	3.47043E+00
103	-9.91712E-03	-1.16240E-03	-4.44414F-05	4.63710E-02
104	-1.74442F-02	-7.40445E-03	1.09476F-04	1.04213E-02
105	-1.74243E+02	-1.48090E+02	-5.15291E-01	3.58905E+00
106	-1.10476E-02	-1.00121F-02	1.75847F-05	3.74701F-02
107	-1.21844E-02	-8.98404F-03	5.46423F-05	2.47751E-02
108	-1.75099E+02	-1.49105C+02	-5.14603E-01	3.60593E+00
109	-1.21767F-02	-8.99803F-03	5.41957E-05	2.44914E-02
110	-1.10566E-02	-9.99464F-03	1.40401E-05	7.73553F-02
111	-1.74246E+02	-1.48099F+02	-5.15274E-01	7.58713E+00
112	-1.74404E-02	-7.41310E-03	1.09609F-04	1.09144F-02
113	-9.07641F-03	-1.16145F-02	-4.41270F-05	4.62470F-02
114	-1.21205F+02	-1.44744F+02	-9.04479F-01	3.47043E+00
115	-1.50524E-02	-6.07961F-03	1.53017E-04	-6.09790C-04
116	-7.02342F-03	-1.26962F-02	-9.67302F-05	5.60014E-02
117	-1.16473E+02	-1.38944F+02	-4.87075E-01	7.75206E+00
118	-1.64777F-02	-4.11843F-03	2.10484F-04	-1.46696E-02
119	-4.43774F-03	-1.36302E-02	-1.56425F-04	6.77684F-02
120	-1.10267E+02	-1.31394E+02	-4.56579E-01	7.10523E+00
121	-1.53142F-02	-4.21061E-03	1.49347F-04	-9.96434E-03
122	-4.44645E-03	-1.19846E-02	-1.27457E-04	6.11519E-02
123	-7.75649E+01	-6.14474F+01	-2.01304E-01	1.54443E+00
124	9.60315E-03	-1.79421E-01	-5.25064E-03	-4.92722E-02
125	-1.97185F-01	-5.74869F-01	-1.05940E-02	-7.45745E-02
126	-5.94725E-01	-4.55548E-01	3.85491E-03	-1.15305E-01
127	-4.55465F-01	-3.06144E-01	4.43650C-03	-1.34861E-01
128	-3.11044E-01	-1.77559E-01	3.70900F-03	-1.43945E-01
129	-1.77574E-01	-3.11651E-01	-7.72424E-03	-1.47936F-01
130	-3.76746E-01	-4.64505E-01	-4.38220E-03	-1.74423E-01
131	-4.54207E-01	-5.46205E-01	-3.66675E-03	-1.15205E-01
132	-5.70514F-01	-2.02510E-01	1.07225E-02	-8.45389E-02
133	-1.74817F-01	9.60170E-03	5.40042F-03	-4.82524E-02
134	-6.14904E+01	-5.94217E+01	4.46979F-02	1.43447E+00
135	-7.01460E-03	-1.83401F-02	-1.97131F-04	1.85594E-02
136	-2.74455E-02	-2.96498E-03	2.98091E-04	-3.81537E-02
137	-1.71340E+02	-1.24964F+02	5.24142F-02	3.19061E+00

138	-7.57649E-03	-1.99294E-02	-2.10651E-04	9.71179F-02
139	-2.19314F-02	-3.22556E-03	3.18492E-04	-4.34004E-02
140	-1.18979E+02	-1.36927E+02	4.47476E-02	3.40352E+00
141	-1.11456E-02	-1.77544E-02	-1.12764E-04	7.53179E-02
142	-2.02141E-02	-6.26408E-03	2.37400E-04	-1.90361E-02
143	-1.44774E+02	-1.42579E+02	4.75039E-02	3.52425E+00
144	-1.35042E-02	-1.55735E-02	-3.52201F-05	5.79943E-02
145	-1.44413E-02	-8.67496E-03	1.74046F-04	1.79667E-04
146	-1.48046E+02	-1.45234E+02	6.15201E-02	3.65243E+00
147	-1.57499E-02	-1.30112E-02	4.66472E-05	3.65112E-02
148	-1.69361E-02	-1.12389E-02	9.71532E-05	2.76434E-02
149	-1.49095E+02	-1.46138E+02	6.74949F-02	3.66514E+00
150	-1.69243E-02	-1.12493E-02	9.64423E-05	2.77434E-02
151	-1.57541E-02	-1.30001E-02	4.70314E-05	3.64836E-02
152	-1.48049E+02	-1.45240E+02	6.15441F-02	3.55271E+00
153	-1.38345F-02	-4.63660E-03	1.73970E-04	2.54632E-04
154	-1.35171E-02	-1.55675E-02	-3.50334F-05	5.79477E-02
155	-1.44779E+02	-1.42541F+02	4.74869E-02	3.52447E+00
156	-2.02144E-02	-6.25647F-03	2.34020F-04	-1.90641E-02
157	-1.11405E-02	-1.77603E-02	-1.12415F-04	7.57346E-02
158	-1.34975F+02	-1.36927E+02	4.42782E-02	3.40183E+00
159	-2.14776E-02	-3.26599E-03	3.17379F-04	-4.29310E-02
160	-7.62947E-03	-1.94440E-02	-2.08965F-04	9.66453E-02
161	-1.31390F+02	-1.24962E+02	5.24419F-02	3.17144E+00
162	-2.94470E-02	-2.95512E-03	2.94244F-04	-3.41432E-02
163	-7.01606F-03	-1.83517E-02	-1.97303E-04	9.85909E-02
164	-6.18454E+01	-5.98197E+01	4.46242E-02	1.44397F+00
165	9.45302E-03	-3.19745E-01	-4.14549F-03	-4.57244E-02
166	-3.40543E-01	-6.05043E-01	-7.34462F-03	-7.40669E-02
167	-6.73049E-01	-2.50701E-01	1.07441E-02	-1.04735E-01
168	-7.62374E-01	-7.84353E-02	5.09731E-03	-1.29117E-01
169	-4.47314F-02	7.06445E-02	4.70601E-03	-1.26929E-01
170	7.06734E-02	-4.40311F-02	-4.79749E-03	-1.26910E-01
171	-7.45526E-02	-2.58502F-01	-5.00109E-03	-1.20051E-01
172	-2.46452E-01	-6.12489E-01	-1.01677F-02	-1.04597E-01
173	-5.75060E-01	-3.45057E-01	6.94452F-03	-7.89991F-02
174	-3.24764E-01	9.44702E-03	9.27261F-03	-4.57429E-02
175	-5.94175E+01	-4.69492F+01	2.77944F-01	1.74757E+00
176	-9.10944E-03	-2.07631E-02	-1.94729F-04	1.12754E-01
177	-7.09054F-02	1.22476E-03	7.77340F-04	-6.50427E-02
178	-1.24956F+02	-1.07553E+02	5.55250E-01	3.13256F+00
179	-1.02049E-02	-2.14201E-02	-1.91233F-04	1.71249E-01
180	-2.75944E-02	4.75792E-04	7.92716F-04	-6.44147F-02
181	-1.36914F+02	-1.10340E+02	5.74137F-01	3.34473E+00
182	-1.39221E-02	-1.77413E-02	-6.58099F-05	4.99511E-02
183	-2.09363E-02	-3.35012E-03	7.99493F-04	-3.37605E-02
184	-1.42571F+02	-1.14269F+02	6.11344F-01	3.51474E+00
185	-1.56405E-02	-1.44143E-02	1.40201F-05	6.64604E-02
186	-1.79440E-02	-6.36753E-03	2.72334E-04	-4.26801E-03
187	-1.45229E+02	-1.15492E+02	6.42345F-01	7.63765F+00
188	-1.75146E-02	-1.17502E-02	9.42940F-05	3.41641E-02
189	-1.42315E-02	-9.65927F-03	1.46140E-04	2.10306E-02
190	-1.46129F+02	-1.15994F+02	6.50407E-01	3.64020E+00
191	-1.32290F-02	-9.66440E-03	1.46743E-04	2.10962E-02
192	-1.75143E-02	-1.17425E-02	9.84929F-05	3.81009E-02
193	-1.45231E+02	-1.15494E+02	6.42401F-01	3.63793E+00
194	-1.99447E-02	-6.35936E-03	2.72414E-04	-4.25541E-03
195	-1.56406F-02	-1.48150E-02	1.40791F-05	6.64535E-02
196	-1.42572E+02	-1.14272E+02	6.11358F-01	3.51463E+00
197	-2.09390E-02	-3.3312E-03	3.00224E-04	-3.34492E-02
198	-1.39140E-02	-1.77456E-02	-6.60205F-05	9.00256E-02
199	-1.36914E+02	-1.10344E+02	5.74072F-01	3.74257E+00
200	-2.25354E-02	3.43331E-04	3.90994E-04	-6.74492F-02
201	-1.02642E-02	-2.13707E-02	-1.49794E-04	1.20638E-01

202	-1.28954E+02	-1.07254E+02	5.55185E-01	1.13434E+00
203	-2.09054E-02	1.23658E-03	3.77587E-04	-6.50955E-02
204	-9.11214E-03	-2.07761E-02	-1.98902E-04	1.12114E-01
205	-5.98155E+01	-4.69505E+01	2.77916E-01	1.34711E+00
206	6.30307E-03	-1.55876E-01	-4.50497E-03	-3.66344E-02
207	-1.75375E-01	-2.11440E-01	-1.01291E-03	-5.69629E-02
208	-2.24462E-01	6.70165E-01	2.49619E-02	-6.92846E-02
209	6.59540E-01	4.09626E-01	-6.94206E-03	-7.52961E-02
210	4.04726E-01	7.52357E-01	9.65641E-03	-7.75342E-02
211	7.52353E-01	4.06413E-01	-9.59132E-03	-7.75024E-02
212	4.11710E-01	6.65160E-01	7.06405E-03	-7.52013E-02
213	6.76797E-01	-2.15417E-01	-2.47944E-02	-6.91069E-02
214	-1.39257E-01	-1.78524E-01	5.75917E-04	-5.64662E-02
215	-1.59091E-01	6.79712E-03	4.59417E-03	-3.66517E-02
216	-4.69414E+01	-2.46660E+01	4.11207E-01	1.14121E+00
217	-1.71301E-02	-1.76516E-02	-1.24261E-04	1.24932E-01
218	-1.56943E-02	7.29971E-03	3.92104E-04	-4.16206E-02
219	-1.07247E+02	-5.50414E+01	1.04122E+00	2.99952E+00
220	-1.11400E-02	-1.66964E-02	-9.40762E-05	1.32476E-01
221	-1.78140E-02	6.74160E-03	4.18404E-04	-4.08997E-02
222	-1.10774E+02	-6.79022E+01	1.08770E+00	1.29314E+00
223	-1.39645E-02	-1.14719E-02	4.72567E-05	4.43459E-02
224	-1.65104E-02	2.47097E-03	3.23685E-04	-3.91847E-02
225	-1.14263E+02	-5.92814E+01	1.18775E+00	3.47630E+00
226	-1.39079E-02	-8.45424E-03	8.61096E-05	0.89047E-02
227	-1.65917E-02	-3.50788E-04	2.76952E-04	-1.18027E-02
228	-1.15446E+02	-5.98691E+01	1.20146E+00	3.52959E+00
229	-1.52765E-02	-5.64535E-03	1.64738E-04	3.73044E-02
230	-1.50457E-02	-4.08805E-03	1.47670E-04	2.05944E-02
231	-1.15992E+02	-5.47630E+01	1.27624E+00	3.53293E+00
232	-1.50877E-02	-4.08051E-03	1.47703E-04	2.06109E-02
233	-1.52744E-02	-5.64146E-03	1.64268E-04	3.72955E-02
234	-1.15447E+02	-5.98697E+01	1.20147E+00	3.52990E+00
235	-1.65946E-02	-3.41815E-04	2.77153E-04	-1.18423E-02
236	-1.39034E-02	-8.45664E-03	8.60609E-05	6.49511E-02
237	-1.14266E+02	-5.92844E+01	1.18775E+00	3.47672E+00
238	-1.65145E-02	2.49141E-03	3.24109E-04	-3.91986E-02
239	-1.39579E-02	-1.14364E-02	4.29976E-05	9.44767E-02
240	-1.10334E+02	-6.00073E+01	1.08727E+00	3.29045E+00
241	-1.77558E-02	6.69921E-03	4.17024E-04	-4.00937E-02
242	-1.12491E-02	-1.66459E-02	-9.21175E-05	1.31664E-01
243	-1.07249E+02	-5.50545E+01	1.04111E+00	3.00216E+00
244	-1.56930E-02	7.30978E-03	3.92260E-04	-4.16404E-02
245	-1.01745E-02	-1.76646E-02	-1.28409E-04	1.25005E-01
246	-4.69426E+01	-2.46711E+01	4.11122E-01	1.14073E+00
247	7.18529E-04	4.96624E-01	1.37753E-02	-2.14392E-02
248	4.47203E-01	1.17428E+00	1.92243E-02	-1.95930E-02
249	1.16157E+00	2.18652E+00	2.46707E-02	-1.22542E-02
250	2.17866E+00	1.17061E+00	-2.90015E-02	-5.71174E-03
251	1.16712E+00	1.65940E+00	1.36745E-02	-2.24419E-03
252	1.65940E+00	1.17174E+00	-1.35572E-02	-2.20174E-03
253	1.17444E+00	2.18445E+00	2.41554E-02	-5.58977E-03
254	2.19672E+00	1.17828E+00	-2.42791E-02	-1.20352E-02
255	1.19092E+00	4.79673E-01	-1.47581E-02	-1.94647E-02
256	4.93997E-01	7.15043E-04	-1.17023E-02	-2.14497E-02
257	-2.46544E+01	4.61690E+00	6.32335E-01	8.48918E-01
258	-8.81095E-03	-8.55674E-03	4.33420E-06	1.16780E-01
259	-5.29409E-03	1.24613E-02	3.09594E-04	-7.91752E-02
260	-5.50446E+01	1.47137E+01	1.49931E+00	2.79536E+00
261	-9.76943E-03	-4.64013E-03	1.74753E-05	1.27874E-01
262	-7.70724E-03	1.49841E-02	3.46951E-04	-7.44974E-02
263	-5.99997E+01	1.37190E+01	1.59251E+00	3.14310E+00
264	-9.19651E-03	9.45084E-04	1.72942E-04	8.49652E-02
265	-7.13269E-03	1.09426E-02	3.20170E-04	-3.19823E-02

266	-5.927A0E+01	2.26041E+01	1.763A6E+00	3.27690E+00
267	-7.93094E-03	1.99659E-03	1.69291E-04	6.36796E-02
268	-A.118A5E-03	9.064A0E-03	2.96439E-04	-8.94531E-03
269	-5.94660E+01	1.94A12E+01	1.71410E+00	3.32661E+00
270	-8.71019E-03	4.89961E-03	2.23558E-04	3.77004E-02
271	-7.48497E-03	5.46501E-03	2.27653E-04	2.15154E-02
272	-5.47612E+01	2.4A401E+01	1.40600E+00	3.33446E+00
273	-7.39104E-03	5.46891E-03	2.27A24E-04	2.14556E-02
274	-A.20301E-03	4.89994E-03	2.23441E-04	3.37640E-02
275	-5.94665E+01	1.94A25E+01	1.71414E+00	7.32697E+00
276	-8.32361E-03	9.07641E-03	2.96718E-04	-9.04496E-03
277	-7.92224E-03	1.99753E-03	1.69160E-04	6.3787AE-02
278	-5.32A07E+01	2.26074E+01	1.76490E+00	7.27745E+00
279	-7.43644E-03	1.09659E-02	7.20634E-04	-3.21036E-02
280	-9.18330E-03	9.42124E-04	1.72666E-04	8.51575E-02
281	-6.90044E+01	1.37139E+01	1.50251E+00	3.13A40E+00
282	-7.64554E-03	1.49433E-02	3.45202E-04	-7.34933E-02
283	-9.42A14E-03	-4.5A960E-03	8.97321E-05	1.2786AF-01
284	-5.50510E+01	1.43025E+01	1.49A21E+00	2.79969E+00
285	-5.29197E-03	1.24641E-02	7.09679E-04	-7.92303E-02
286	-A.41695E-03	-A.56865E-03	4.23412E-04	1.16A57E-01
287	-2.46595E+01	4.60720E+00	6.32234E-01	4.44345E-01
288	-6.61319E-03	4.95197E-01	1.39392E-02	-2.73955E-07
289	4.47313E-01	5.6A074E+00	1.44250E-01	2.6147AF-02
290	5.67264E+00	1.71A95E+00	-1.09426E-01	5.51732E-02
291	1.71467E+00	4.00716E+00	6.61402E-02	7.41233E-02
292	4.09529E+00	4.73546E-01	-1.00603E-01	A.21974E-02
293	4.77591E-01	4.18134E+00	1.00771E-01	7.29347E-02
294	4.10322E+00	1.7277AE+00	-6.59444E-02	7.42659E-02
295	1.73204E+00	5.69457E+00	1.10069E-01	7.54377E-02
296	5.70219E+00	4.8434AE-01	-1.44940E-01	2.62795E-02
297	4.92154E-01	-6.61746E-01	-1.7A544E-02	-2.81250E-03
298	4.62A44E+00	7.49344E+01	7.41093E-01	6.463734E-01
299	-3.1A931E-07	6.17111E-03	1.5A939E-04	8.34260E-02
300	6.96132E-03	1.59225E-02	1.51107E-04	-3.24103E-02
301	1.43173E+01	9.77276E+01	1.401A7E+00	2.47A44E+00
302	-5.46144E-03	1.70999E-02	3.44734E-04	9.19611E-02
303	4.44706E-03	2.12269E-02	2.17999E-04	-4.63486E-02
304	1.37141E+01	1.2067AF+02	2.71067E+00	3.01167E+00
305	4.94346E-03	1.44523E-02	1.44314E-04	6.22222E-02
306	1.72321E-07	2.43547E-02	3.42586E-04	-1.26694E-02
307	2.76100E+01	1.29199E+02	2.10623E+00	2.92142E+00
308	6.413A1E-05	1.06100E-02	3.73310E-04	5.04525E-02
309	6.4817AE-03	1.4A733E-02	2.10626E-04	2.16A95E-04
310	1.44773E+01	1.29557E+02	2.37A00E+00	3.12535E+00
311	5.75226E-03	1.64731E-02	1.42134E-04	2.41223E-02
312	6.95144E-04	2.14179E-02	7.53379E-04	2.24644E-02
313	2.44462E+01	1.23326E+02	2.12742E+00	2.75077E+00
314	6.473A2E-04	2.14249E-02	3.53631E-04	2.27174E-02
315	5.76269E-03	1.64304E-02	1.41914E-04	2.42726E-02
316	1.447A6E+01	1.29562E+02	2.37A04E+00	3.12575E+00
317	6.47717E-03	1.44662E-02	2.10926E-04	5.05611E-05
318	7.62654E-05	1.96109E-02	3.7311E-04	5.062A9E-02
319	2.2A007E+01	1.20113E+02	2.10633E+00	2.92251E+00
320	1.72075E-03	2.43A24E-02	7.53739E-04	-1.29726E-02
321	4.75976E-07	1.4452AE-02	1.4A050E-04	6.24A32E-02
322	1.37090E+01	1.20675E+02	2.71073E+00	3.00565E+00
323	A.49997E-03	2.11A94E-02	2.16789E-04	-4.51229E-02
324	-5.51315E-07	1.71479E-02	7.46432E-04	7.07310E-02
325	1.43061E+01	9.77124E+01	1.40179E+00	2.4A423E+00
326	6.96271E-03	1.5A236E-02	1.51107E-04	-5.2A519E-02
327	-3.19609E-03	6.12167E-03	1.5A493E-04	A.43024E-02
328	4.61915E+00	3.49199E+01	7.40983E-01	6.45155E-01
329	-1.4A404E-02	-1.63722E+00	-4.49539E-02	1.24A44E-02

330	-1.63990F+00	1.36443E+01	4.24669E-01	6.59127E-02
331	1.36460E+01	-3.23114E+00	-4.68410E-01	1.11426E-01
332	-3.23242E+00	1.08374E+01	3.90441E-01	1.34936E-01
333	1.08373E+01	-4.90729E+00	-4.37349E-01	1.51301E-01
334	-4.90729E+00	1.04441E+01	4.37534E-01	1.51307E-01
335	1.04447E+01	-3.21659E+00	-3.90591E-01	1.39054E-01
336	-3.21529E+00	1.36736E+01	4.69135E-01	1.11712E-01
337	1.36754E+01	-1.64446E+00	-4.25563E-01	6.60745E-02
338	-1.63793E+00	-1.49777E-02	4.50444E-02	1.24665E-02
339	3.99410E+01	7.92152E+01	8.70024E-01	4.65950E-01
340	7.51040E-03	2.53448E-02	3.04194E-04	3.19205E-02
341	1.44454E-02	1.94616E-02	8.55139E-05	-7.11950E-03
342	9.77297E+01	1.77133E+02	1.71533E+00	2.06262E+00
343	9.41090E-03	3.45327E-02	4.21574E-04	3.64637E-02
344	2.51045E-02	2.11111E-02	-6.41663E-05	2.45445E-04
345	1.20677E+02	1.95210E+02	1.61018E+00	3.7344E+00
346	2.12423E-02	2.51476E-02	6.65462E-05	3.07629E-02
347	1.54960E-02	3.34809E-02	3.06692E-04	9.29675E-03
348	1.20113E+02	1.99270E+02	1.70497E+00	2.37600E+00
349	1.34443E-02	3.35590E-02	3.43009E-04	2.65544E-02
350	2.70443E-02	2.53674E-02	3.89394E-05	1.43694E-02
351	1.29553E+02	2.05010E+02	1.63005E+00	2.45126E+00
352	2.21342E-02	2.49055E-02	4.71904E-05	2.17752E-02
353	1.39754E-02	3.34564E-02	3.39034E-04	1.93703E-02
354	1.23330E+02	2.02490E+02	1.71470E+00	2.39052E+00
355	1.39691E-02	3.34652E-02	3.39392E-04	1.31290E-02
356	2.21444E-02	2.49006E-02	4.69265E-05	2.20201E-02
357	1.29554E+02	2.05014E+02	1.63014E+00	2.45164E+00
358	2.70419E-02	2.53798E-02	3.91461E-05	1.41341E-02
359	1.34547E-02	3.35544E-02	3.42774E-04	2.64013E-02
360	1.20116E+02	1.99331E+02	1.70907E+00	2.37645E+00
361	1.34444E-02	3.35073E-02	3.07061E-04	8.49429E-03
362	2.13010E-02	2.51929E-02	6.63464E-05	3.11021E-02
363	1.20670E+02	1.95212E+02	1.61024E+00	2.36514E+00
364	2.51549E-02	2.10747E-02	-6.95105E-05	1.71551E-03
365	9.77147E-03	3.45753E-02	4.22966E-04	3.51464E-02
366	9.77141E+01	1.77114E+02	1.71525E+00	2.06949E+00
367	1.44439E-02	1.94557E-02	8.54661E-05	-7.14771E-03
368	7.50447E-02	2.53426E-02	3.04180E-04	3.19941E-02
369	3.49261E+01	7.91966E+01	8.69945E-01	4.65329E-01
370	-2.64475E-02	-1.09902E+00	-2.97260E-02	1.77440E-02
371	-1.09919E+00	1.25038E+01	3.74000E-01	7.47140E-02
372	1.25047E+01	-1.46793E+00	-3.99351E-01	1.23481E-01
373	-1.46779E+00	9.96767E+00	3.24767E-01	1.54042E-01
374	9.96773E+00	-3.40752E+00	-3.71535E-01	1.67472E-01
375	-3.40751E+00	9.97347E+00	3.71694E-01	1.67922E-01
376	9.97342E+00	-1.45135E+00	-3.24466E-01	1.54176E-01
377	-1.45144E+00	1.25415E+01	3.99405E-01	1.24164E-01
378	1.25416E+01	-1.10703E+00	-3.79124E-01	7.48707E-02
379	-1.10449E+00	-2.64424E-02	2.99447E-02	1.77052E-02
380	7.92121E+01	1.23646E+02	9.60745E-01	3.34052E-01
381	2.35449E-02	4.10440E-02	2.94407E-04	-2.17563E-02
382	2.36799E-02	2.40607E-02	1.25163E-04	4.19128E-02
383	1.77131E+02	2.51457E+02	1.61426E+00	1.74423E+00
384	2.44940E-02	4.18796E-02	2.24192E-04	-1.93764E-02
385	2.49519E-02	2.67352E-02	-5.44536E-05	5.49755E-02
386	1.95215E+02	2.52045E+02	1.22764E+00	2.03103E+00
387	3.11471E-02	3.65147E-02	9.09184E-05	-1.55324E-03
388	2.45721E-02	3.56851E-02	1.21296E-04	3.58239E-02
389	1.99215E+02	2.61202E+02	1.33907E+00	2.02675E+00
390	2.41636E-02	3.96549E-02	1.95954E-04	3.08627E-03
391	3.49046E-02	3.41253E-02	5.49225E-05	3.19663E-02
392	2.05014E+02	2.59752E+02	1.14244E+00	2.09914E+00
393	3.04946E-02	3.53164E-02	9.21563E-05	1.66227E-02

394	2.90297E-02	3.88879F-02	1.85162F-04	1.86334C-02
395	2.02895E+02	2.64715E+02	1.33570E+00	2.03888E+00
396	2.90295E-02	3.88946E-02	1.85297F-04	1.93071F-02
397	3.05044E-02	3.53110E-02	8.19598F-05	1.69467E-02
398	2.05023F+02	2.59761E+02	1.18249E+00	2.09951E+00
399	3.09063F-02	3.41336E-02	5.50344F-05	3.16659E-02
400	2.91775E-02	3.96545E-02	1.95714E-04	3.39459E-03
401	1.79276E+02	2.61218E+02	1.33920E+00	2.02779E+00
402	2.95759E-02	3.57000E-02	1.21487F-04	3.53043E-02
403	3.12086E-02	3.65294E-02	9.07169E-05	-1.12239E-03
404	1.95216E+02	2.22053E+02	1.22782E+00	2.01978E+00
405	2.79801E-02	2.67111E-02	-5.57454E-05	5.27032E-02
406	2.94799E-02	4.19133E-02	2.29095E-04	-2.11174E-02
407	1.77112E+02	2.51833E+02	1.61416E+00	1.75393E+00
408	2.96715E-02	2.80504F-02	1.25831E-04	4.17825E-02
409	2.75424E-02	4.10413E-02	2.98399F-04	-2.16583E-02
410	7.91936E-01	1.23669F+02	9.60784E-01	3.37369E-01
411	-4.18350E-02	6.98768E-01	2.05612E-02	9.80232E-03
412	6.99277E-01	4.96094E+00	1.18770F-01	4.95046E-02
413	4.96023E+00	2.81893E+00	-5.94833E-02	8.98226E-02
414	2.81897F+00	4.26172E+00	4.00763F-02	1.15473E-01
415	4.26125E+00	1.99078E+00	-6.30689E-02	1.24447E-01
416	1.99079E+00	4.26433E+00	6.31543F-02	1.26957E-01
417	4.26439F+00	2.87141E+00	-3.98850F-02	1.14442F-01
418	2.87166E+00	4.99536F+00	6.01028F-02	8.93446E-02
419	4.99607E+00	6.99387E-01	-1.19630E-01	4.72245E-02
420	6.99467F-01	-4.18265F-02	-2.02462E-02	9.63677E-03
421	1.23676E+02	7.29090E+01	-1.08671F+00	4.27357E-01
422	3.99549E-02	2.46289E-02	-2.61752F-04	-5.77561E-02
423	2.95046E-02	1.43741E-02	-2.41645E-04	7.97364E-02
424	2.51855E+02	1.41543E+02	-2.38701F+00	1.11047E+00
425	4.13352F-02	2.27304F-02	-3.17263E-04	-5.76951F-02
426	3.19229E-02	1.39249E-02	-3.06916F-04	9.00750E-02
427	2.52050E+02	1.78796E+02	-2.44657E+00	2.09198E+00
428	3.92687E-02	2.19752F-02	-2.96607F-04	-2.91791E-02
429	3.61275E-02	1.59160E-02	-3.46366F-04	6.42715E-02
430	2.61199F+02	1.40277E+02	-2.61220E+00	2.11024E+00
431	3.99473E-02	2.07935E-02	-3.79539E-04	-1.26649F-02
432	3.63406E-02	1.96233E-02	-3.02129E-04	4.96194E-02
433	2.59756E+02	1.41512E+02	-2.55437F+00	2.17650E+00
434	3.72126E-02	2.06339E-02	-2.82712E-04	1.19356E-02
435	3.77157E-02	1.96049E-02	-3.08839E-04	2.42614F-02
436	2.64711E+02	1.42510E+02	-2.63995E+00	2.13030E+00
437	3.77234E-02	1.96057E-02	-3.08956E-04	2.35494E-02
438	3.72093E-02	2.06376F-02	-2.92643F-04	1.26354E-02
439	2.59765F+02	1.41515E+02	-2.55450E+00	2.17682E+00
440	3.63506E-02	1.86225E-02	-3.02314E-04	4.79357F-02
441	3.89495E-02	2.07913E-02	-3.09649F-04	-1.19991E-02
442	2.61215F+02	1.40292F+02	-2.61224E+00	2.11167E+00
443	3.61399E-02	1.58137E-02	-3.46617E-04	6.32398E-02
444	3.92899E-02	2.18883E-02	-2.96729F-04	-2.83097E-02
445	2.52059E+02	1.39804E+02	-2.44659E+00	2.07671E+00
446	3.19237E-02	1.39139E-02	-3.07117E-04	9.19126E-02
447	4.13434E-02	2.27514E-02	-3.17045E-04	-5.93332E-02
448	2.51831E+02	1.41525E+02	-2.38299F+00	1.12301E+00
449	2.94804F-02	1.43269E-02	-2.41526F-04	7.95314E-02
450	3.99516E-02	2.46375F-02	-2.61146F-04	-5.74562E-02
451	1.23660F+02	7.29016E+01	-1.09650E+00	4.26395E-01
452	-2.57324E-02	3.11693E-01	9.37792E-03	-6.43370E-03
453	3.09662E-01	1.05405E+00	2.06775F-02	8.62531F-03
454	1.05159E+00	2.69874E+00	4.54765F-02	2.89518E-02
455	2.68695F+00	2.17242E+00	-1.42923E-02	4.45569E-02
456	2.17161E+00	2.83764E+00	1.85008F-02	5.17179E-02
457	2.93767F+00	2.17337E+00	-1.84530F-02	4.93765E-02

454	2.17425E+00	2.64969E+00	1.43174E-02	3.74864E-02
459	2.69155E+00	1.04115E+00	-4.47333E-02	1.67631E-02
460	1.09213E+00	2.95063E-01	-2.21404E-02	6.72847E-02
461	3.13645E+01	-2.5716E-02	-9.42935E-03	-4.46631E-03
462	7.28991E+01	2.58492E+01	-1.01553E+00	7.12649E-01
463	2.70824E-02	7.99474E-03	-3.25510E-04	-6.91403E-02
464	1.24619E-02	4.17432E-03	-1.41326E-04	9.47959E-02
465	1.41544E+02	4.53724E+01	-2.07754E+00	2.15901E+00
466	2.62536E-02	4.53009E-03	-3.36339E-04	-7.36159E-02
467	1.35643E-02	3.36205E-03	-1.73976E-04	1.11244E-01
468	1.38797E+02	4.09994E+01	-2.11264E+00	2.46655E+00
469	2.43140E-02	6.40222E-03	-3.05513E-04	-4.37529E-02
470	1.69205E-02	2.80550E-03	-2.40699E-04	8.37930E-02
471	1.40274E+02	3.49257E+01	-2.14947E+00	2.44334E+00
472	2.29944E-02	5.75344E-03	-2.94443E-04	-1.94137E-02
473	1.49966E-02	4.19225E-03	-2.50749E-04	6.03936E-02
474	1.41517E+02	3.90714E+01	-2.21299E+00	2.59907E+00
475	2.17644E-02	5.41664E-03	-2.65201E-04	1.18051E-02
476	2.05901E-02	4.43449E-03	-2.64669E-04	2.95142E-02
477	1.42511E+02	3.90433E+01	-2.23516E+00	2.47456E+00
478	2.75352E-02	4.49472E-03	-2.66644E-04	3.26319E-02
479	2.14255E-02	5.75141E-03	-2.67279E-04	4.69294E-03
480	1.41515E+02	3.90712E+01	-2.21105E+00	2.50928E+00
481	1.44394E-02	4.25749E-03	-2.44569E-04	6.36056E-02
482	2.30614E-02	5.64432E-03	-2.96254E-04	-2.26130E-02
483	1.40297E+02	3.49174E+01	-2.18996E+00	2.44477E+00
484	1.68643E-02	2.45660E-03	-2.34954E-04	4.73797E-02
485	2.44077E-02	6.33201E-03	-3.04240E-04	-4.67326E-02
486	1.34815E+02	4.09423E+01	-2.11344E+00	2.47914E+00
487	2.67424E-02	6.43472E-03	-3.40162E-04	-7.46327E-02
488	2.67424E-02	6.43472E-03	-3.40162E-04	-7.46327E-02
489	1.41504E+02	4.47943E+01	-2.17627E+00	2.24644E+00
490	1.34444E-02	4.22470E-03	-1.19221E-04	1.07161E-01
491	2.71524E-02	7.74370E-03	-3.27461E-04	-7.21771E-02
492	7.24917E+01	2.54404E+01	-1.01606E+00	7.13474E-01
493	-1.15057E-02	-4.57745E-03	-1.23495E-02	-1.94037E-02
494	-4.63479E-01	-2.47102E-01	6.00492E-03	-1.94426E-02
495	-2.52664E-01	9.52334E-01	3.34721E-02	-1.21566E-02
496	9.44457E-01	1.38346E+00	1.20974E-02	-3.31296E-03
497	1.34200E+00	1.76339E+00	1.05970E-02	3.23215E-03
498	1.76741E+00	1.34146E+00	-1.05945E-02	5.50522E-03
499	1.34147E+00	9.51900E-01	-1.19992E-02	3.52936E-03
500	9.55447E-01	-2.49070E-01	-3.34599E-02	-1.03414E-03
501	-2.47543E-01	-4.51942E-01	-5.67773E-03	4.43703E-02
502	-4.44247E-01	-1.15170E-02	1.21325E-02	-2.22749E-02
503	2.58819E+01	-1.42456E+01	-4.67719E-01	9.47797E-01
504	1.34179E-02	-5.47747E-03	-3.35177E-04	-6.64659E-02
505	-4.04725E-04	-3.61301E-03	-5.46414E-05	1.03544E-01
506	4.53717E+01	-3.44594E+01	-1.72455E+00	2.44607E+00
507	1.29841E-02	-7.05540E-03	-3.41797E-04	-7.67323E-02
508	-7.57146E-04	-4.57114E-03	-6.43564E-05	1.13993E-01
509	4.19984E+01	-3.92930E+01	-1.73452E+00	2.67172E+00
510	1.11413E-02	-6.79948E-03	-3.06629E-04	-5.02935E-02
511	1.34793E-03	-6.05506E-03	-1.26173E-04	9.44544E-02
512	3.49257E+01	-4.24430E+01	-1.75463E+00	2.70523E+00
513	9.51701E-03	-6.65421E-03	-2.75763E-04	-2.41604E-02
514	7.75634E-03	-6.40926E-03	-1.73351E-04	6.40519E-02
515	3.90709E+01	-4.38242E+01	-1.79074E+00	2.76976E+00
516	7.64251E-03	-6.34263E-03	-2.39167E-04	9.47446E-03
517	5.97136E-03	-6.50206E-03	-2.12706E-04	3.54055E-02
518	3.70432E+01	-4.41879E+01	-1.79749E+00	2.74951E+00
519	5.79545E-03	-6.51911E-03	-2.17407E-04	3.52156E-02
520	7.05461E-03	-6.32727E-03	-2.34497E-04	1.00745E-02
521	3.90707E+01	-4.34107E+01	-1.79094E+00	2.76976E+00

522	3.77964E-03	-6.43224E-01	-1.74140E-04	6.95231E-02
523	9.49431E-01	-6.64525E-03	-2.75223E-04	-2.35924E-02
524	3.99174E+01	-4.24940E+01	-1.75979E+00	2.70657E+00
525	1.35241E-03	-6.04253E-03	-1.26786E-04	9.41436E-02
526	1.11852E-02	-6.79512E-03	-3.76614E-04	-4.99617E-02
527	4.99866E+01	-3.97013E+01	-1.73442E+00	2.67972E+00
528	-1.34793E-04	-4.47190E-03	-6.20706E-05	1.20727E-01
529	1.30675E-02	-7.09966E-03	-3.43837E-04	-7.87451E-02
530	4.53909E+01	-3.44348E+01	-1.72452E+00	2.47511E+00
531	-3.78059E-04	-3.65413E-03	-5.58659E-05	1.02472E-01
532	1.37956E-02	-5.77435E-03	-3.33550E-04	-6.59384E-02
533	2.59732E+01	-1.42770E+01	-4.67346E-01	9.91157E-01
534	7.07563E-04	-6.53748E-01	-1.91793E-02	-3.17471E-02
535	-6.62547E-01	-7.39743E-01	-2.11656E-03	-4.67637E-02
536	-7.47159E-01	-1.20471E-01	1.71747E-02	-5.43699E-02
537	-1.34959E-01	2.99677E-01	1.73510E-02	-5.74495E-02
538	4.16519E-01	7.43916E-01	7.14993E-03	-5.81419E-02
539	7.43916E-01	4.95330E-01	-7.18180E-03	-5.81067E-02
540	4.18435E-01	-1.40129E-01	-1.74601E-02	-5.73917E-02
541	-1.34045E-01	-7.59674E-01	-1.73497E-02	-5.42676E-02
542	-7.50201E-01	-6.40642E-01	3.04331E-03	-4.60062E-02
543	-6.31809E-01	7.44654E-04	1.75709E-02	-3.09953E-02
544	-1.42901E+01	-4.54895E+01	-6.73977E-01	1.22399E+00
545	2.40272E-03	-1.57132E-02	-3.09926E-04	-5.24977E-02
546	-9.63574E-03	-9.45504E-03	7.08145E-06	9.50759E-02
547	-3.44619E+01	-9.56470E+01	-1.32176E+00	2.75159E+00
548	2.17162E-03	-1.69519E-02	-3.26106E-04	-6.63609E-02
549	-1.10093E-02	-9.00913E-03	1.87433E-05	1.17376E-01
550	-3.92959E+01	-9.99217E+01	-1.30967E+00	2.99122E+00
551	5.24944E-04	-1.63645E-02	-2.99009E-04	-4.54312E-02
552	-9.77929E-03	-1.19370E-02	-3.50209E-05	9.26195E-02
553	-4.24951E+01	-1.07210E+02	-1.31181E+00	2.90576E+00
554	-1.12096E-03	-1.57353E-02	-2.49214E-04	-2.15895E-02
555	-7.74657E-03	-1.31741E-02	-9.25551E-05	6.97460E-02
556	-4.18262E+01	-1.05183E+02	-1.32546E+00	2.95661E+00
557	-7.20757E-03	-1.44561E-02	-1.99640E-04	1.94740E-02
558	-5.26834E-07	-1.42617E-02	-1.53361E-04	7.75925E-02
559	-4.41849E+01	-1.05405E+02	-1.33115E+00	2.94598E+00
560	-5.23359E-03	-1.42940E-02	-1.54505E-04	3.69324E-02
561	-7.24259E-03	-1.48279E-02	-1.97560E-04	1.11345E-02
562	-4.79326E+01	-1.05192E+02	-1.32551E+00	2.95666E+00
563	-7.71747E-03	-1.37114E-02	-1.36864E-05	6.87492E-02
564	-1.15191E-03	-1.57117E-02	-2.48284E-04	-2.09951E-02
565	-4.75091E+01	-1.07220E+02	-1.31171E+00	2.90606E+00
566	-9.77390E-03	-1.18602E-02	-7.55774E-05	9.27494E-02
567	5.13497E-04	-1.63560E-02	-2.97671E-04	-4.51066E-02
568	-3.97075E+01	-9.99206E+01	-1.10949E+00	2.98699E+00
569	-1.10978E-02	-9.93638E-03	2.13269E-05	1.17702E-01
570	2.25949E-03	-1.70215E-02	-3.29793E-04	-6.77627E-02
571	-3.44412E+01	-9.56277E+01	-1.32179E+00	2.74375E+00
572	-9.60325E-03	-9.49250E-03	1.89977E-06	9.43873E-02
573	2.78697E-03	-1.56596E-02	-7.07744E-04	-5.18257E-02
574	-1.42916E+01	-4.54698E+01	-6.73745E-01	1.22621E+00
575	1.06977E-02	-5.03802E-01	-1.42917E-02	-3.80964E-02
576	-5.14455E-01	-7.93828E-01	-7.76036E-03	-6.02688E-02
577	-8.74427E-01	-5.69960E-01	6.51299E-03	-7.73466E-02
578	-5.77749E-01	-2.02575E-01	1.04226E-02	-3.79530E-02
579	-2.06614E-01	-4.67292E-03	7.61085E-03	-9.21351E-02
580	-4.66819E-03	-2.10047E-01	-5.70496E-02	-9.29975E-02
581	-2.06055E-01	-5.88334E-01	-1.06189E-03	-8.81042E-02
582	-5.80609E-01	-8.17979E-01	-6.59361E-03	-7.75805E-02
583	-8.07310E-01	-4.95862E-01	9.65134E-03	-6.02921E-02
584	-4.95164E-01	1.07360E-02	1.77759E-02	-3.90037E-02
585	-4.54923E+01	-6.63869E+01	-4.51377E-01	1.40507E+00

586	-6.15035E-07	-2.11199E-07	-2.56977E-04	-3.24672E-02
587	-1.50470E-07	-1.30649E-07	3.44829E-05	4.00432E-02
588	-9.56514E+01	-1.76047E+02	-8.72647E-01	2.95067E+00
589	-5.65872E-03	-2.24321E-02	-2.86034E-04	-4.86600E-02
590	-1.70101E-07	-1.28690E-02	7.06173E-05	9.74700E-02
591	-9.39262E+01	-1.39301E+02	-8.50594E-01	3.03005E+00
592	-7.30966E-03	-2.17164E-02	-2.59797E-04	-3.36315E-02
593	-1.63966E-02	-1.47393E-02	2.82622E-05	8.30444E-02
594	-1.33214E+07	-1.47154E+02	-8.41293E-01	7.04224E+00
595	-8.51069E-03	-2.04151E-02	-2.09424E-04	-1.43980E-02
596	-1.49174E-07	-1.64711E-02	-2.64445E-05	6.40976E-02
597	-1.05147E+02	-1.44127E+02	-8.41192E-01	3.07623E+00
598	-1.76070E-07	-1.44493E-02	-1.50453E-04	1.24989E-02
599	-1.26374E-02	-1.82334E-02	-9.54255E-05	3.69744E-02
600	-1.85809E+02	-1.44424E+02	-8.42823E-01	7.06961E+00
601	-1.26001E-02	-1.42725E-02	-9.67181E-05	3.64036E-02
602	-1.36420E-07	-1.44179E-02	-1.49584E-04	1.34726E-02
603	-1.05196E+02	-1.44134E+02	-8.41161E-01	3.87614E+00
604	-1.44884E-07	-1.65119E-02	-2.76452E-05	6.35640E-02
605	-8.54467E-03	-2.07459E-02	-2.08680E-04	-1.74662E-02
606	-1.33225E+02	-1.47164E+02	-8.41179E-01	3.04240E+00
607	-1.63497E-07	-1.47636E-02	2.77291E-05	8.27934E-02
608	-7.02485E-07	-2.17074E-02	-2.50710E-04	-3.13422E-02
609	-9.99251E+01	-1.39244E+02	-8.50459E-01	3.03397E+00
610	-1.70452E-07	-1.27014E-02	7.32215E-05	9.85474E-02
611	-5.57653E-03	-2.75044E-02	-2.88708E-04	-4.97512E-02
612	-9.56721E+01	-1.38024E+02	-8.72569E-01	2.94492E+00
613	-1.50502E-07	-1.30972E-02	7.33034E-05	7.94445E-02
614	-6.06464E-03	-2.10727E-02	-2.55459E-04	-3.23299E-02
615	-4.54726E+01	-6.83622E+01	-8.51269E-01	1.40660E+00
616	1.77336E-02	-2.55624E-01	-7.59727E-03	-4.11170E-02
617	-2.66420E-01	-6.12472E-01	-9.61418E-03	-6.50242E-02
618	-6.24273E-01	-6.47109E-01	-5.28773E-04	-4.61710E-02
619	-6.51839E-01	-5.31230E-01	7.35024E-03	-1.00434E-01
620	-5.75743E-01	-4.22078E-01	3.15735E-03	-1.08211E-01
621	-4.22130E-01	-5.49127E-01	-3.27770E-03	-1.04277E-01
622	-5.35716E-01	-6.63601E-01	-7.55237E-03	-1.01023E-01
623	-6.35144E-01	-6.77352E-01	4.94335E-04	-8.64360E-02
624	-6.25444E-01	-2.52305E-01	1.03772E-02	-6.50930E-02
625	-2.41267E-01	1.77771E-02	7.19567E-03	-4.10496E-02
626	-6.63490E+01	-7.61574E+01	-2.11022E-01	1.52515E+00
627	-1.49335E-02	-2.19646E-02	-1.84110E-04	-1.29454E-02
628	-1.66934E-07	-1.41642E-02	4.71765E-05	6.30916E-02
629	-1.36054E+02	-1.54155E+02	-7.01031E-01	3.07222E+00
630	-1.00541E-07	-2.33260E-02	-2.26323E-04	-2.82492E-02
631	-1.47640E-02	-1.33900E-02	9.15729E-05	7.87669E-02
632	-1.39704E+02	-1.56739E+02	-3.67405E-01	3.11291E+00
633	-1.10721E-02	-2.26616E-02	-1.97633E-04	-1.84719E-02
634	-1.85500E+02	-1.49146E-02	6.19249E-05	6.91164E-02
635	-1.47165E+02	-1.58549E+02	-3.53926E-01	3.11236E+00
636	-1.23229E-02	-2.16755E-02	-1.59446E-04	-4.64930E-03
637	-1.76165E-02	-1.66007E-02	1.73224E-05	5.53743E-02
638	-1.44174E+07	-1.60191E+02	-3.46479E-01	7.13114E+00
639	-1.41427E-07	-2.00869E-02	-1.01365E-04	1.60299E-02
640	-1.58240E-02	-1.95644E-02	-4.86525E-05	3.46912E-02
641	-1.44411E+07	-1.60401E+02	-3.44991E-01	3.12501E+00
642	-1.57943E-02	-1.86044E-02	-4.79259E-05	3.42319E-02
643	-1.41413E-02	-2.00444E-02	-1.00056E-04	1.64951E-02
644	-1.44141E+07	-1.60195E+02	-3.46415E-01	7.13093E+00
645	-1.75870E-07	-1.66405E-02	1.61410E-05	5.49246E-02
646	-1.23646E-02	-2.16429E-02	-1.58220E-04	-4.24442E-03
647	-1.42170E+02	-1.58551E+02	-7.53471E-01	3.11263E+00
648	-1.45382E-07	-1.49414E-02	6.13245E-05	6.88730E-02
649	-1.10979E-02	-2.26507E-02	-1.97007E-04	-1.82069E-02

650	-1.39300E+02	-1.56328E+02	-3.67842E-01	3.11459E+00
651	-1.40259E-02	-1.33142E-02	9.39690E-05	7.95443E-02
652	-9.98410E-03	-2.33972E-02	-2.20730E-04	-2.90415E-02
653	-1.36031E+02	-1.54126E+02	-3.90997E-01	3.06790E+00
654	-1.66510E-02	-1.41915E-02	4.19424E-05	6.26244E-02
655	-1.09601E-02	-2.19209E-02	-1.86911E-04	-1.24970E-02
656	-6.63644E+01	-7.61319E+01	-2.11004E-01	1.52616E+00
657	2.07810E-02	-2.91792E-02	-1.38779E-03	-4.10827E-02
658	-3.99579E-02	-3.81438E-01	-9.51747E-03	-6.27708E-02
659	-3.92012E-01	-5.26497E-01	-7.73570E-03	-8.39486E-02
660	-5.34535E-01	-5.61932E-01	-7.61046E-04	-9.95088E-02
661	-5.66279E-01	-5.19156E-01	1.30760E-03	-1.07640E-01
662	-5.19210E-01	-5.69629E-01	-1.40051E-03	-1.07705E-01
663	-5.65440E-01	-5.44596E-01	5.78982E-04	-9.96967E-02
664	-5.76646E-02	-4.04698E-01	3.66529E-03	-8.42129E-02
665	-3.94071E-01	-2.60185E-02	1.02237E-02	-6.28476E-02
666	-1.62169E-02	2.08296E-02	1.02907E-03	-4.10260E-02
667	-7.61599E+01	-7.43641E+01	3.87922E-02	1.58424E+00
668	-1.19310E-02	-1.87409E-02	-1.16004E-04	3.90268E-03
669	-1.46991E-02	-1.27124E-02	3.37086E-05	4.75330E-02
670	-1.54163E+02	-1.49221E+02	1.06774E-01	3.10944E+00
671	-1.08474E-02	-2.00705E-02	-1.57749E-04	-8.88732E-03
672	-1.65499E-02	-1.15767E-02	8.48064E-05	5.99011E-02
673	-1.56747E+02	-1.50543E+02	1.25386E-01	3.12332E+00
674	-1.15855E-02	-1.95314E-02	-1.75500E-04	-3.12309E-03
675	-1.65615E-02	-1.26426E-02	6.68270E-05	5.39213E-02
676	-1.58554E+02	-1.57068E+02	1.40206E-01	3.11394E+00
677	-1.74824E-02	-1.86471E-02	-1.04999E-04	5.41648E-03
678	-1.51117E-02	-1.39654E-02	3.66006E-05	4.52508E-02
679	-1.60200E+02	-1.53271E+02	1.49695E-01	3.12130E+00
680	-1.74115E-02	-1.71470E-02	-5.68785E-05	1.91071E-02
681	-1.49411E-02	-1.57073E-02	-1.30669E-05	3.15025E-02
682	-1.60110E+02	-1.53709E+02	1.53416E-01	3.11419E+00
683	-1.49174E-02	-1.57436E-02	-1.47092E-05	3.11479E-02
684	-1.38459E-02	-1.71109E-02	-5.56745E-05	1.94627E-02
685	-1.50204E+02	-1.53271E+02	1.49770E-01	3.12109E+00
686	-1.80830E-02	-1.40014E-02	3.54975E-05	4.48940E-02
687	-1.25238E-02	-1.86066E-02	-1.03728E-04	5.77086E-03
688	-1.59560E+02	-1.57069E+02	1.40722E-01	3.11407E+00
689	-1.65443E-02	-1.26654E-02	6.61403E-05	5.16497E-02
690	-1.16140E-02	-1.95172E-02	-1.34703E-04	-2.87733E-03
691	-1.56337E+02	-1.50576E+02	1.25713E-01	3.12514E+00
692	-1.65996E-02	-1.15104E-02	8.67847E-05	6.07904E-02
693	-1.07907E-02	-2.01314E-02	-1.59283E-04	-9.39142E-03
694	-1.54174E+02	-1.49183E+02	1.06945E-01	3.10590E+00
695	-1.46404E-02	-1.27344E-02	3.24342E-05	4.71403E-02
696	-1.19713E-02	-1.86990E-02	-1.14726E-04	4.27724E-03
697	-7.61744E+01	-7.47419E+01	3.87212E-02	1.58488E+00
698	1.99045E-02	1.00366E-01	2.76211E-03	-3.88212E-02
699	9.30906E-02	-2.01077E-01	-8.16992E-03	-5.57629E-02
700	-2.9252E-01	-7.37667E-01	-7.56708E-03	-7.39404E-02
701	-3.44005E-01	-4.19826E-01	-2.10614E-03	-8.77598E-02
702	-4.23744E-01	-4.07412E-01	5.50840E-04	-9.51352E-02
703	-4.07466E-01	-4.24995E-01	-5.98025E-04	-9.51906E-02
704	-4.21684E-01	-3.50605E-01	1.97442E-03	-8.79235E-02
705	-7.44359E-01	-7.20628E-01	3.43696E-03	-7.41769E-02
706	-2.12343E-01	1.05060E-01	9.81784E-03	-5.58287E-02
707	1.12336E-01	1.89562E-02	-2.59388E-03	-3.87641E-02
708	-7.43671E+01	-6.08871E+01	2.91202E-01	1.58535E+00
709	-9.30907E-03	-1.27335E-02	-5.83966E-05	1.57357E-02
710	-9.97746E-03	-9.13501E-03	1.26607E-05	3.53423E-02
711	-1.49229E+02	-1.21240E+02	6.03768E-01	3.06106E+00
712	-8.39686E-03	-1.38384E-02	-9.27926E-05	6.97062E-03
713	-1.12177E-02	-7.98423E-03	5.50708E-05	4.31104E-02

714	-1.50553E+02	-1.22029E+02	6.16192E-01	3.06215E+00
715	-8.31437E-03	-1.34263E-02	-7.64725E-05	9.44137E-03
716	-1.17230E-02	-4.57424E-03	4.64745E-05	3.99412E-02
717	-1.52077E+02	-1.22905E+02	6.30195E-01	3.04525E+00
718	-9.40405E-03	-1.27752E-02	-5.74144E-05	1.40727E-02
719	-1.12404E-02	-9.34945E-03	3.15633E-05	3.55235E-02
720	-1.53240E+02	-1.23673E+02	6.39595E-01	3.04580E+00
721	-1.11440E-02	-1.16578E-02	-2.54133E-05	2.14294E-02
722	-1.06743E-02	-1.06121E-02	1.12952E-06	2.40474E-02
723	-1.53714E+02	-1.23915E+02	6.43425E-01	3.03685E+00
724	-1.06520E-02	-1.06425E-02	1.61665E-07	2.77423E-02
725	-1.01726E-02	-1.16267E-02	-2.47973E-05	2.16914E-02
726	-1.53241E+02	-1.23671E+02	6.39654E-01	3.04542E+00
727	-1.12134E-02	-9.42026E-03	3.05453E-05	3.52494E-02
728	-9.44766E-03	-1.27437E-02	-5.62756E-05	1.43425E-02
729	-1.52079E+02	-1.22907E+02	6.30215E-01	3.04524E+00
730	-1.13023E-02	-4.59679E-03	4.61799E-05	3.97672E-02
731	-8.95515E-03	-1.34067E-02	-7.59111E-05	1.00739E-02
732	-1.50546E+02	-1.22030E+02	6.16017E-01	3.06446E+00
733	-1.12384E-02	-7.93778E-03	5.62914E-05	4.33311E-02
734	-4.36446E-03	-1.34804E-02	-9.39465E-05	6.73537E-03
735	-1.49192E+02	-1.21239E+02	6.07464E-01	3.05774E+00
736	-9.42405E-03	-9.16749E-03	1.13324E-05	3.50226E-02
737	-9.34255E-03	-1.26960E-02	-5.71447E-05	1.60354E-02
738	-7.43449E+01	-6.04717E+01	2.91056E-01	1.54576E+00
739	1.23457E-02	9.42774E-02	2.27584E-03	-3.51714E-02
740	9.00575E-02	-4.34408E-02	-4.41662E-03	-4.61246E-02
741	-4.17540E-02	-1.61261E-01	-2.07519E-03	-5.91956E-02
742	-1.65161E-01	-2.21105E-01	-1.55400E-03	-0.93135E-02
743	-2.73223E-01	-2.14800E-01	2.33947E-04	-7.47419E-02
744	-2.14450E-01	-2.23450E-01	-2.50009E-04	-7.44201E-02
745	-2.71413E-01	-1.64340E-01	1.44594E-03	-6.94316E-02
746	-1.04532E-01	-9.92546E-02	1.92427E-03	-5.43785E-02
747	-9.02637E-02	9.76755E-02	5.21915E-03	-4.61697E-02
748	1.01413E-01	1.23940E-02	-2.44376E-03	-3.51127E-02
749	-6.04499E-01	-3.59474E-01	5.39470E-01	1.57267E+00
750	-4.33222E-03	-6.16326E-03	-3.12243E-05	2.19715E-02
751	-7.44479E-03	-4.67410E-03	-1.75240E-05	2.72043E-02
752	-1.21247E+02	-7.11019E+01	1.04413E+00	2.93250E+00
753	-3.92401E-02	-6.77666E-03	-4.45773E-05	1.76032E-02
754	-4.50916E-03	-3.92172E-03	1.00174E-05	3.03942E-02
755	-1.22036E+02	-7.14457E+01	1.09248E+00	2.92941E+00
756	-4.20646E-03	-6.51324E-03	-3.93369E-05	1.45841E-02
757	-4.64574E-03	-4.11000E-03	9.13652E-06	2.91274E-02
758	-1.22912E+02	-7.17935E+01	1.10430E+00	2.90634E+00
759	-4.35539E-03	-6.16346E-03	-3.08393E-05	1.98659E-02
760	-4.75024E-03	-4.45454E-03	5.04321E-06	2.75722E-02
761	-1.23641E+02	-7.21611E+01	1.11295E+00	2.90335E+00
762	-4.56552E-03	-5.57677E-03	-1.72446E-05	2.24692E-02
763	-4.65756E-03	-5.04534E-03	-6.61277E-06	2.48260E-02
764	-1.23923E+02	-7.22443E+01	1.11634E+00	2.49244E+00
765	-4.03442E-03	-5.07028E-03	-7.42578E-06	2.46261E-02
766	-4.54923E-03	-5.55126E-03	-1.64051E-05	2.26654E-02
767	-1.23679E+02	-7.21547E+01	1.11296E+00	2.90293E+00
768	-4.72672E-03	-4.44041E-03	4.20034E-06	2.73631E-02
769	-4.34366E-03	-6.13700E-03	-2.98992E-05	2.00700E-02
770	-1.22913E+02	-7.17935E+01	1.10432E+00	2.90625E+00
771	-4.62414E-03	-4.13012E-03	4.42505E-06	2.49373E-02
772	-4.24033E-03	-6.44997E-03	-3.43625E-05	1.87854E-02
773	-1.22037E+02	-7.14515E+01	1.09274E+00	2.93102E+00
774	-4.50551E-03	-3.90616E-03	1.02204E-05	3.03922E-02
775	-3.92946E-03	-6.79012E-03	-4.47752E-05	1.75962E-02
776	-1.21246E+02	-7.10699E+01	1.04392E+00	2.92922E+00
777	-3.44441E-03	-4.70703E-03	-1.47031E-05	2.69604E-02

77A	-4.7600AE-03	-6.13446E-03	-3.02580E-05	2.21979E-02
779	-6.0A744E+01	-3.59097E+01	5.39302E-01	1.57244E+00
7A0	4.07457E-07	9.40400E-03	1.44151E-04	-3.06277E-02
7A1	7.54509E-03	-1.07A71E-02	-5.10227E-04	-3.49099E-02
7A2	-1.107A3E-02	-4.6A905E-02	-9.40339E-04	-4.12711E-02
7A7	-4.46151E-02	-5.76741E-02	-2.51638E-04	-4.62630E-02
7A4	-5.96234E-02	-6.35A4E-02	-1.37915E-04	-4.89943E-02
7A5	-6.36337E-02	-5.97645E-02	1.35257E-04	-4.90059E-02
7A6	-5.79070E-02	-4.9A933E-02	2.72596E-04	-4.61230E-02
7A7	-4.42619E-02	-1.36266E-02	9.620A9E-04	-4.11776E-02
7A8	-1.14241E-02	9.41232E-03	5.51011E-04	-3.49231E-02
7A9	1.71721E-02	4.09676E-03	-1.69036E-04	-3.05774E-02
790	-7.59199E+01	1.64158E-04	7.75940E-01	1.43279E+00
791	4.49299E-04	-2.03114E-03	-4.22A09E-05	2.27573E-02
792	7.53097E-04	-1.63540E-03	-4.07304E-05	2.32619E-02
793	-7.11049E+01	3.51A17E-04	1.53605E+00	2.73140E+00
794	4.23441E-04	-2.0A894E-03	-4.2A436E-05	2.17650E-02
795	6.691A6E-04	-1.47450E-03	-3.65557E-05	2.30567E-02
796	-7.14490E+01	3.59A45E-04	1.54349E+00	2.72293E+00
797	7.68762E-04	-2.00754E-03	-4.05224E-05	2.19306E-02
79A	6.09523E-04	-1.49594E-03	-3.59039E-05	2.27022E-02
799	-7.17967E+01	3.566A0E-04	1.55100E+00	2.69937E+00
800	7.61179E-04	-1.90632E-03	-3.86663E-05	2.17960E-02
801	5.1A871E-04	-1.54545E-03	-3.520A4E-05	2.26739E-02
802	-7.21644E+01	3.57235E-04	1.55A94E+00	2.69339E+00
803	3.76792E-04	-1.77A54E-03	-3.70967E-05	2.19264E-02
804	4.4293AE-04	-1.65259E-03	-3.57344E-05	2.21995E-02
805	-7.22476E+01	3.54A22E-04	1.56074E+00	2.69314E+00
806	4.63970E-04	-1.67439E-03	-3.64640E-05	2.20319E-02
807	7.747A9E-04	-1.75673E-03	-3.63414E-05	2.20904E-02
808	-7.21670E+01	3.57111E-04	1.55A99E+00	2.69295E+00
809	5.39A37E-04	-1.56746E-03	-3.59751E-05	2.23077E-02
810	3.77679E-04	-1.8A329E-03	-3.7A724E-05	2.19630E-02
811	-7.17967E+01	3.56669E-04	1.55100E+00	2.67929E+00
812	6.7209AE-04	-1.51717E-03	-3.6650A9E-05	2.25345E-02
813	3.44120E-04	-1.9A581E-03	-3.77316E-05	2.20094E-02
814	-7.1454AF+01	7.67479E-04	1.54361E+00	2.77439E+00
815	6.71054E-04	-1.49921E-03	-3.71794E-05	2.27017E-02
816	4.0125AE-04	-2.07336E-03	-4.21991E-05	2.19066E-02
817	-7.10729E+01	3.50995E-04	1.53576E+00	2.77934E+00
818	7.7763AE-04	-1.65750E-03	-4.15257E-05	2.30677E-02
819	4.23674E-04	-2.00754E-03	-4.145A9E-05	2.29182E-02
820	-7.59111E+01	1.66376E-04	7.75774E-01	1.43272E+00
821	0.	0.	0.	0.
822	0.	0.	0.	0.
823	0.	0.	0.	0.
824	0.	0.	0.	0.
825	0.	0.	0.	0.
826	0.	0.	0.	0.
827	0.	0.	0.	0.
828	0.	0.	0.	0.
829	0.	0.	0.	0.
830	0.	0.	0.	0.

MN	STRSOJ	STRSOK	STRSIJ	STRSIK
11	3.44227E+00	1.06107E+00	3.84225E+00	6.06720E+00
14	3.40207E+00	9.13815E-01	3.80204E+00	6.11265E+00
17	4.01022E+00	9.60414E-01	4.01019E+00	6.45003E+00
20	4.14391E+00	9.73532E-01	4.14387E+00	6.64017E+00
23	4.28101E+00	1.02652E+00	4.28098E+00	6.48457E+00
26	4.30716E+00	1.02721E+00	4.30317E+00	6.92343E+00
29	4.24140E+00	1.02671E+00	4.28136E+00	6.44505E+00
32	4.14417E+00	9.73735E-01	4.14414E+00	6.58049E+00
35	4.00829E+00	9.58954E-01	4.00826E+00	6.44772E+00
38	3.40331E+00	9.14817E-01	3.40328E+00	6.11407E+00
41	3.43949E+00	1.05932E+00	3.43987E+00	6.06433E+00
52	1.26492E+00	-5.46167E-01	6.27483E+00	7.72681E+00
55	1.15472E+00	-7.76949E-01	6.39292E+00	7.49797E+00
58	1.22479E+00	-4.15627E-01	6.71413E+00	8.34547E+00
61	1.24559E+00	-4.82045E-01	6.95194E+00	8.65405E+00
64	1.31061E+00	-4.65753E-01	7.16437E+00	8.90946E+00
67	1.31049E+00	-4.41425E-01	7.20698E+00	8.96073E+00
70	1.31046E+00	-8.65542E-01	7.16848E+00	8.30997E+00
73	1.24516E+00	-4.41756E-01	6.95233E+00	8.65443E+00
76	1.22316E+00	-4.17267E-01	6.71165E+00	8.34399E+00
79	1.15549E+00	-7.75753E-01	6.35451E+00	7.89951E+00
82	1.26737E+00	-5.47537E-01	6.27277E+00	7.72414E+00
93	-5.04530E-01	-1.32244E+00	7.76425E+00	8.41573E+00
96	-6.33774E-01	-1.65772E+00	8.04066E+00	8.77342E+00
99	-6.53667E-01	-1.63873E+00	8.50741E+00	9.29591E+00
102	-7.46431E-01	-1.73771E+00	8.42457E+00	9.65123E+00
105	-8.42492E-01	-1.72545E+00	9.09167E+00	9.92571E+00
108	-6.97944E-01	-1.74725E+00	9.14393E+00	9.94333E+00
111	-6.82641E-01	-1.72522E+00	9.44217E+00	9.42020E+00
114	-7.06639E-01	-1.73744E+00	8.82491E+00	9.55355E+00
117	-6.55237E-01	-1.64064E+00	8.50517E+00	9.29365E+00
120	-6.32445E-01	-1.55625E+00	8.04225E+00	8.74126E+00
123	-5.09444E-01	-1.32407E+00	7.76202E+00	8.41364E+00
134	-1.48294E+00	-1.70211E+00	8.25531E+00	8.11061E+00
137	-1.52237E+00	-1.41626E+00	8.81455E+00	8.72971E+00
140	-1.57240E+00	-1.44267E+00	9.36155E+00	9.24976E+00
143	-1.66047E+00	-1.56475E+00	9.72929E+00	9.65240E+00
146	-1.64116E+00	-1.51669E+00	1.00092E+01	9.94953E+00
149	-1.66444E+00	-1.53921E+00	1.00613E+01	9.95749E+00
152	-1.64094E+00	-1.51642E+00	1.00097E+01	9.91006E+00
155	-1.66061E+00	-1.56453E+00	9.72960E+00	9.65274E+00
158	-1.57443E+00	-1.48444E+00	9.35914E+00	9.24956E+00
161	-1.52043E+00	-1.41722E+00	8.41622E+00	8.73134E+00
164	-1.48343E+00	-1.30326E+00	8.25360E+00	8.10914E+00
175	-1.66392E+00	-5.39046E-01	7.74414E+00	6.44827E+00
178	-1.49270E+00	-3.69295E-01	4.65265E+00	7.75392E+00
181	-1.50714E+00	-3.45523E-01	9.26460E+00	8.33530E+00
184	-1.58277E+00	-3.45741E-01	9.63370E+00	8.64412E+00
187	-1.53545E+00	-2.36147E-01	9.44975E+00	8.44399E+00
190	-1.57111E+00	-2.54866E-01	9.92459E+00	8.47103E+00
193	-1.53557E+00	-2.75823E-01	9.89020E+00	8.45041E+00
196	-1.54245E+00	-3.45517E-01	9.63414E+00	8.64459E+00
199	-1.51003E+00	-3.48543E-01	9.26177E+00	8.73258E+00
202	-1.49029E+00	-3.62017E-01	8.65495E+00	7.75032E+00
205	-1.66496E+00	-5.40371E-01	7.74678E+00	6.44711E+00
216	-1.04429E+00	1.62900E-01	6.30176E+00	4.74401E+00
219	-5.45024E-01	1.56162E+00	7.57773E+00	5.49242E+00
222	-4.65414E-01	1.73446E+00	8.21491E+00	6.45011E+00
225	-4.4762E-01	1.95435E+00	8.54069E+00	6.61420E+00
228	-7.8799E-01	2.05205E+00	8.70632E+00	6.76214E+00

231	-3.96449E-01	2.10477E+00	8.72893E+00	6.72795E+J0
234	-3.74437E-01	2.05244E+00	8.7072AE+00	6.7625MF+00
237	-4.4832AE-01	1.95473E+00	8.54133E+00	6.61884F+00
240	-4.69519E-01	1.73023E+00	8.21103E+00	6.4511AF+J0
247	-5.41603E-01	1.56481E+00	7.5812AE+00	5.19014F+J0
246	-1.0856AE+00	1.61187E-01	6.30057E+00	4.74309E+00
257	1.96440E-01	2.75522F+00	4.07576E+00	2.02877E+J0
260	1.29234E+00	4.32384E+00	5.62291E+00	3.19774E+J0
263	1.53513F+00	4.75717F+00	6.2554AE+00	3.67785E+J0
266	1.74364E+00	5.72243E+00	6.40722E+00	3.54415F+J0
269	1.78370E+00	5.25174E+00	6.49354E+00	3.71910E+J0
272	1.94237E+00	5.49636E+00	6.46530E+00	3.54211E+J0
275	1.74415E+00	5.25224E+00	6.49404E+00	3.71954E+00
27A	1.74425E+00	5.32313E+00	6.40804E+00	3.54490F+40
2A1	1.52021E+00	4.75125F+00	6.24997E+00	3.67234E+00
2A4	1.29717F+00	4.32442E+00	5.62820E+00	3.20320E+J0
257	1.94627E-01	2.75296F+00	4.07470F+00	2.02803E+J0
29A	2.11293F+00	5.11177E+00	1.3A460E+00	-1.01447E+00
301	3.90471E+00	7.59835E+00	2.77832E+00	-1.39195E-01
304	4.58310F+00	9.25A20E+00	3.50417E+00	-2.35405E-01
307	4.85307E+00	9.11450E+00	3.07427E+00	-3.7476E-01
310	4.9A536E+00	9.79665F+00	3.45302E+00	-3.96004E-01
313	4.9A857E+00	9.792A6E+00	3.033A4E+00	-4.09601F-01
316	4.98594E+00	9.79734E+00	3.45350E+00	-3.95052F-01
319	4.85395E+00	9.11557E+00	3.07521E+00	-3.74093F-01
322	4.57491F+00	9.25013E+00	3.49638E+00	-2.43764F-01
325	3.91170E+00	7.55675F+00	2.7A579E+00	-1.30576E-01
32A	2.11054E+00	5.10A91F+00	1.3A374E+00	-1.71497E+00
339	4.6766AE+00	1.15723E+00	-1.49854E+00	-4.30694E+J0
342	6.999A7E+00	1.04704F+01	-6.88A44E-01	-3.46528F+J0
345	A.41342F+00	1.16716E+01	-1.07992E+00	-3.64016F+00
34A	A.39269C+00	1.19502E+01	-1.05697E+00	-1.97304F+00
351	8.90492E+00	1.22029E+01	-1.28752E+00	-3.92997F+J0
354	9.55247E+00	1.20291E+01	-1.15025E+00	-3.93214E+00
357	A.90554F+00	1.22037E+01	-1.2A71AE+00	-3.72077F+J0
360	A.39393E+00	1.18519E+01	-1.05599E+00	-3.12229E+00
363	A.40272E+00	1.16607E+01	-1.09079E+00	-3.6971AF+J0
366	7.00A76F+00	1.04791F+01	-6.7A705E-01	-3.4500F+00
369	4.63374E+00	1.15397E+00	-1.49114E+00	-4.30732E+J0
380	7.81861E+00	1.17063E+01	-4.64511E+00	-7.75523E+J0
392	1.00491E+01	1.33152F+01	-3.80673E+00	-6.49917E+00
3A6	1.12199E+01	1.37027E+01	-4.13930E+00	-6.12642E+00
3A9	1.13A90F+01	1.40973F+01	-4.28484E+00	-6.45226E+J0
392	1.17373F+01	1.42697E+01	-4.39179E+00	-6.30576F+J0
395	1.15645E+01	1.42669E+01	-4.39709E+00	-6.55905E+00
39A	1.17391E+01	1.41706F+01	-4.39165E+00	-6.30562E+00
401	1.13899F+01	1.40994E+01	-4.28382E+00	-6.45145E+00
404	1.12040E+01	1.36A22E+01	-4.15424E+00	-6.14159E+00
407	1.00611E+01	1.33269E+01	-3.872A4E+00	-6.48552E+J0
410	7.8151AE+00	1.17030E+01	-4.64563E+00	-7.755A7E+00
421	1.19417E+01	7.5038AE+00	-7.51A32F+00	-3.96807E+00
424	1.34026E+01	8.5A122E+00	-6.41158E+00	-2.55445E+00
427	1.37835E+01	8.83345E+00	-6.04610E+00	-2.08609E+J0
430	1.42076E+01	8.92246E+00	-6.34170E+00	-2.11359E+00
433	1.42322E+01	9.06404E+00	-6.20361E+00	-2.06912E+J0
436	1.43877E+01	9.04659F+00	-6.43799E+00	-2.16513E+J0
439	1.42330F+01	9.06462E+00	-6.20350E+00	-2.064A0E+00
442	1.42107F+01	A.92494E+00	-6.3403AE+00	-2.11221F+J0
445	1.37634E+01	A.81369E+00	-6.06647E+00	-2.10642E+J0
44A	1.34192E+01	A.59706E+00	-6.39409E+00	-2.53715F+00
451	1.19377E+01	7.50069E+00	-7.51970E+00	-3.97010E+00
462	A.25774E+00	4.14833E+00	-3.21266E+00	7.4A151E-02
465	9.05555E+00	4.85217F+00	-2.0A013E+00	1.2825AE+00
46A	9.24922F+00	4.97524F+00	-1.669A9E+00	1.74969F+00

471	9.36311E+00	4.93727E+00	-1.67301E+00	1.47J46F+J0
474	9.50490F+00	5.02654F+00	-1.62923E+00	1.95271F+00
477	9.50724E+00	4.94501E+00	-1.70448E+00	1.91374F+J0
479	9.50441E+00	5.02685E+00	-1.62904E+00	1.95300E+00
483	9.36563F+00	4.93479F+00	-1.67163E+00	1.47304E+00
486	9.74656E+00	5.07055E+00	-1.57445E+00	1.44035E+00
489	9.15634F+00	4.95567E+00	-1.97621E+00	1.74436F+00
492	9.26036E+00	4.15044F+00	-3.20447E+00	7.47077F-J02
501	4.87566F+00	1.76444E+00	8.03237E-01	3.61221E+00
506	5.27153F+00	1.74233E+00	1.70200F+00	4.49336E+J0
509	5.32536E+00	1.81661E+00	2.10046E+00	4.90795F+J0
512	5.27054E+00	1.72153F+00	2.21727E+00	5.06380F+J0
515	5.37134E+00	1.74425E+00	2.29755F+00	5.1905E+J0
518	5.34344E+00	1.70549E+00	2.27183E+00	5.18190E+J0
521	5.77156E+00	1.74813E+00	2.29774E+00	5.19045E+J0
524	5.24110F+00	1.72263E+00	2.21935E+00	5.06010E+J0
527	5.33612E+00	1.82645E+00	2.11147E+00	4.91480F+J0
530	5.75746E+00	1.76472E+00	1.68682E+00	4.47413F+00
533	4.88430F+00	1.37409E+00	8.12756E-01	3.62052E+J0
544	1.94849E+00	-7.38392E-01	4.23734E+00	6.41921F+00
547	2.13343F+00	-5.40411E-01	4.84464E+00	6.9A03E+J0
550	7.09352E+00	-5.56167E-01	5.18515E+00	7.30498E+00
553	1.94670F+00	-6.67413E-01	5.72913E+00	7.45242F+00
556	1.99534E+00	-6.46394E-01	5.44324E+00	7.54467E+00
559	1.96560F+00	-7.27653E-01	5.44176E+00	7.59876F+J0
562	1.99513F+00	-6.46706E-01	5.44357E+00	7.54304F+00
565	1.94723F+00	-6.66641F-01	5.33034E+00	7.45394E+J0
568	2.10092F+00	-5.48445F-01	5.19305F+00	7.31258F+J0
571	2.12376F+00	-5.50731E-01	4.83356E+00	6.97299E+00
574	1.99557F+00	-7.30777E-01	4.24264E+00	6.42372F+00
585	-2.59591E-01	-2.04604E+00	6.49446E+00	8.35465F+J0
588	-2.77664E-01	-2.04323F+00	7.24753E+00	8.65999F+J0
591	-3.59497E-01	-2.040445F+00	7.50201F+00	8.47479F+00
594	-4.87032E-01	-2.18914E+00	7.63315E+00	8.99446F+J0
597	-5.24364F-01	-2.23039E+00	7.74704E+00	9.10859E+J0
600	-5.64714F-01	-2.26955E+00	7.76004E+00	9.12424F+J0
603	-5.24854F-01	-2.23074F+00	7.74723E+00	9.10473F+J0
606	-4.46433E-01	-2.18472F+00	7.67420F+00	8.79573F+00
609	-3.54254F-01	-2.07445E+00	7.50716E+00	8.98371F+00
612	-2.44427F-01	-2.04945F+00	7.23925E+00	8.55159E+00
615	-2.53792F-01	-2.07945F+00	6.90114E+00	8.36199E+00
626	-1.76854F+00	-2.62243E+00	8.67744E+00	9.36060F+00
629	-1.88275E+00	-2.67390E+00	8.82101E+00	9.45393F+00
632	-1.97236E+00	-2.71672E+00	8.98743E+00	9.58292F+J0
635	-2.04678E+00	-2.41245E+00	9.08780E+00	9.66056F+J0
638	-2.15794F+00	-2.85907E+00	9.14147E+00	9.74292E+00
641	-2.14657E+00	-2.89457E+00	9.19776E+00	9.75016E+J0
644	-2.15456E+00	-2.46025F+00	9.18145E+00	9.74241E+J0
647	-2.09664E+00	-2.41261E+00	9.08835E+00	9.66112E+00
650	-1.96461E+00	-2.71245F+00	8.99054E+00	9.58597E+J0
653	-1.84746E+00	-2.67434E+00	8.81449E+00	9.44720F+00
656	-1.76374E+00	-2.61757E+00	8.67844E+00	9.36150E+00
667	-2.46637F+00	-2.30940F+00	9.51709E+00	9.34151E+00
670	-2.67503F+00	-2.40901E+00	9.50346E+00	9.33064E+00
673	-2.70214E+00	-2.44445E+00	9.59820E+00	9.39525E+00
676	-2.81115E+00	-2.52749E+00	9.66304E+00	9.43014E+00
679	-2.87321E+00	-2.57034E+00	9.73023E+00	9.44794F+00
682	-2.90929E+00	-2.59843E+00	9.74216E+00	9.49384E+J0
685	-2.87779E+00	-2.57077E+00	9.72994F+00	9.44756E+J0
688	-2.81111F+00	-2.52741F+00	9.66333E+00	9.43637F+00
691	-2.69027E+00	-2.44574E+00	9.60024E+00	9.39741E+J0
694	-2.62444E+00	-2.41203F+00	9.49776E+00	9.32466E+00
697	-2.46243E+00	-2.30575F+00	9.51702E+00	9.39167E+J0
708	-2.30673F+00	-1.12833E+00	9.39465F+00	8.45197F+00

711	-2.47339E+00	-1.25141E+00	9.26695E+00	8.28970E+00
714	-2.52895E+00	-1.24214E+00	9.31559E+00	8.31422E+00
717	-2.61977E+00	-1.34373E+00	9.34560E+00	8.32557E+00
720	-2.67067E+00	-1.37657E+00	9.38841E+00	8.35116E+00
723	-2.70161E+00	-1.39903E+00	9.39184E+00	8.34974E+00
726	-2.67117E+00	-1.37699E+00	9.38793E+00	8.35259E+00
729	-2.51897E+00	-1.34373E+00	9.34566E+00	8.32559E+00
732	-2.52642E+00	-1.28007E+00	9.31746E+00	8.32034E+00
735	-2.47615E+00	-1.25431E+00	9.26126E+00	8.29395E+00
738	-2.30369E+00	-1.12594E+00	9.39419E+00	8.45199E+00
741	-1.26794E+00	9.14983E-01	8.31292E+00	6.56045E+00
752	-1.42217E+00	7.71301E-01	8.11989E+00	6.36511E+00
755	-1.45897E+00	7.52183E-01	8.14197E+00	6.37304E+00
758	-1.52779E+00	7.06471E-01	8.14210E+00	6.35469E+00
761	-1.56533E+00	6.86447E-01	8.16500E+00	6.36358E+00
764	-1.58977E+00	6.64956E-01	8.15961E+00	6.35264E+00
767	-1.56591E+00	6.85992E-01	8.16438E+00	6.36294E+00
770	-1.52795E+00	7.06347E-01	8.14201E+00	6.35456E+00
773	-1.45691E+00	7.54052E-01	8.14413E+00	6.37537E+00
776	-1.42469E+00	7.68356E-01	8.11408E+00	6.35965E+00
779	-1.26677E+00	9.16207E-01	8.31229E+00	6.56648E+00
790	6.50636E-01	3.79049E+00	6.30232E+00	3.79445E+00
793	5.05157E-01	3.61297E+00	6.09920E+00	3.61295E+00
796	4.78926E-01	3.60174E+00	6.10004E+00	3.60175E+00
799	4.32508E-01	3.57056E+00	6.08098E+00	3.57053E+00
802	4.04576E-01	3.56270E+00	6.08597E+00	3.56267E+00
805	3.81797E-01	3.54915E+00	6.07533E+00	3.54912E+00
808	4.04104E-01	3.56212E+00	6.08531E+00	3.56209E+00
811	4.32440E-01	3.57050E+00	6.08091E+00	3.57047E+00
814	4.80592E-01	3.60369E+00	6.10215E+00	3.60366E+00
817	5.02575E-01	3.60991E+00	6.09403E+00	3.60190E+00
820	6.51122E-01	3.79027E+00	6.30160E+00	3.79426E+00

PROBLEM NUMBER 5

RUNGE-KUTTA INTERVAL = 6

TOTAL PERCENT OF LOAD INCLUDED AT THIS TIME = 100
PERCENT OF TOTAL LOAD TAKEN IN THIS INTERVAL = 17

NODE	DELTA X	DISPLACEMENTS DELTA Y	DELTA Z	THETA X	THETA Y
1	0.	0.	0.	0.	-8.56324E-03
2	0.	0.	0.	0.	-9.17124E-03
3	0.	0.	0.	0.	-9.46274E-03
4	0.	0.	0.	0.	-1.03473E-02
5	0.	0.	0.	0.	-1.07479E-02
6	0.	0.	0.	0.	-1.09065E-02
7	0.	0.	0.	0.	-1.04994E-02
8	0.	0.	0.	0.	-1.06842E-02
9	0.	0.	0.	0.	-1.03006E-02
10	0.	0.	0.	0.	-9.77040E-03
11	0.	0.	0.	0.	-9.30925E-03
12	-3.76714E-01	-5.05395E-03	2.12374E-02	8.60341E-05	-7.32070E-03
13	-4.05972E-01	-5.01463E-03	2.41175E-02	7.49070E-05	-7.97919E-03
14	-4.37231E-01	-4.95580E-03	2.63064E-02	5.34837E-05	-8.62344E-03
15	-4.68445E-01	-4.86730E-03	2.78141E-02	3.54677E-05	-9.10859E-03
16	-4.77079E-01	-4.75690E-03	2.87519E-02	2.02392E-05	-9.43974E-03
17	-4.84207E-01	-4.63420E-03	2.92157E-02	6.66625E-06	-9.59076E-03
18	-4.81975E-01	-4.51035E-03	2.92166E-02	-7.57697E-06	-9.59252E-03
19	-4.74392E-01	-4.39633E-03	2.87056E-02	-2.47447E-05	-9.40694E-03
20	-4.57194E-01	-4.30229E-03	2.76261E-02	-3.93211E-05	-9.06234E-03
21	-4.33352E-01	-4.23630E-03	2.61762E-02	-4.55290E-05	-8.57430E-03
22	-4.12437E-01	-4.19311E-03	2.46293E-02	-4.54465E-05	-8.14247E-03
23	-3.92797E-01	-4.17171E-03	2.60744E-02	2.94956E-04	-3.99823E-03
24	-3.63636E-01	-4.11134E-03	4.62361E-02	2.63694E-04	-4.53267E-03
25	-3.57544E-01	-4.04570E-03	9.44272E-02	1.97746E-04	-5.01096E-03
26	-3.96597E-01	-3.91685E-03	1.00710E-01	1.36147E-04	-5.36297E-03
27	-4.26049E-01	-3.74472E-03	1.04134E-01	8.04911E-05	-5.60245E-03
28	-4.39746E-01	-3.54403E-03	1.06090E-01	3.03670E-05	-5.73044E-03
29	-4.40375E-01	-3.34470E-03	1.06247E-01	-2.13691E-05	-5.76552E-03
30	-4.24534E-01	-3.16406E-03	1.04501E-01	-8.12903E-05	-5.68540E-03
31	-3.94671E-01	-3.02646E-03	1.00594E-01	-1.39262E-04	-5.48526E-03
32	-3.52246E-01	-2.94194E-03	9.50702E-02	-1.65090E-04	-5.16662E-03
33	-3.13666E-01	-2.90047E-03	8.92769E-02	-1.62657E-04	-4.83396E-03
34	-2.71777E-01	-2.16114E-02	1.00717E-01	4.94390E-04	5.36923E-04
35	-2.99500E-01	-1.16136E-02	1.17901E-01	4.40566E-04	4.25064E-04
36	-3.61799E-01	-1.15535E-02	1.71759E-01	3.28580E-04	2.71815E-04
37	-4.15064E-01	-1.14104E-02	1.41662E-01	2.24712E-04	1.73443E-04
38	-4.51507E-01	-1.12125E-02	1.41124E-01	1.76795E-04	1.04094E-04
39	-4.69213E-01	-1.09832E-02	1.51694E-01	6.42438E-05	4.88773E-05
40	-4.71446E-01	-1.07498E-02	1.57763E-01	-7.72070E-06	-1.54502E-05
41	-4.55459E-01	-1.05773E-02	1.50970E-01	-9.75292E-05	-7.44123E-05
42	-4.21796E-01	-1.03721E-02	1.45619E-01	-1.94617E-04	-1.17250E-04
43	-3.71484E-01	-1.02783E-02	1.37102E-01	-2.62126E-04	-8.05929E-05
44	-3.23633E-01	-1.02416E-02	1.27407E-01	-2.72432E-04	1.27454E-05
45	-2.04713E-01	-1.18397E-02	2.24200E-02	4.36202E-04	5.32614E-03
46	-6.73497E-01	-1.18392E-02	3.81733E-04	3.89661E-04	5.71424E-03
47	-7.42734E-01	-1.17477E-02	5.04135E-02	2.78567E-04	5.94666E-03
48	-7.93494E-01	-1.16423E-02	5.45574E-02	1.75044E-04	6.22273E-03

49	-A.2413AE-01	-1.14773E-02	6.36550E-02	1.04769E-04	6.37506E-03
50	-A.45744E-01	-1.1269AE-02	6.64733E-02	7.39247E-05	6.4417AE-03
51	-A.44464E-01	-1.10610E-02	6.91193E-02	4.41640E-05	6.3A966E-03
52	-A.37534E-01	-1.38699E-02	7.0027AE-02	-2.51964E-07	6.2253AE-03
53	-A.09627E-01	-1.07141E-02	6.84650E-02	-9.17160E-05	5.94543E-03
54	-7.640A1E-01	-1.06212E-02	6.32356E-02	-1.43257E-04	5.65145E-03
55	-7.19975E-01	-1.05A35E-02	5.57627E-02	-2.138A9E-04	5.39130E-03
56	-7.45922E-01	-9.66246E-03	-2.07497E-01	-3.4A891E-05	9.42953E-03
57	-3.965A9E-01	-9.644A7E-03	-2.0A04E-01	-4.7A299E-05	1.01A76E-02
58	-4.49721E-01	-9.59735E-03	-2.11027E-01	-9.73205E-05	1.04474E-02
59	-4.86787E-01	-9.50705E-03	-2.15038E-01	-1.12119E-04	1.13A60E-02
60	-5.12401E-01	-9.39430E-03	-2.18092E-01	-6.31650E-05	1.17250E-02
61	-5.24A45E-01	-9.27076E-03	-2.19007E-01	2.26407E-05	1.1902AE-02
62	-5.30070E-01	-9.14597E-03	-2.16192E-01	1.26950E-04	1.1A907E-02
63	-5.23484E-01	-9.02A75E-03	-2.10006E-01	2.22796E-04	1.17010E-02
64	-5.07322E-01	-A.92779E-03	-2.01094E-01	2.51907E-04	1.1275AE-02
65	-4.76431E-01	-A.85761E-03	-1.930A3E-01	2.0166AE-04	1.0707AE-02
66	-4.46201E-01	-A.81945E-03	-1.86592E-01	1.76750E-04	1.00A53E-02
67	-2.39070E-02	-5.56A77E-03	-5.96128E-01	-9.247A1E-04	1.20A12E-02
68	-4.98849E-02	-5.56291E-03	-6.29061E-01	-9.03802E-04	1.30795E-02
69	-7.93984E-02	-5.55777E-03	-6.60356E-01	-8.31836E-04	1.40351E-02
70	-9.742AAE-02	-5.55059E-03	-6.87131E-01	-6.25205E-04	1.47312E-02
71	-1.1174AE-01	-5.54547E-03	-7.04540E-01	-3.605A9E-04	1.51745E-02
72	-1.18059E-01	-5.54200E-03	-7.12916E-01	-A.7A310E-05	1.53AAAE-02
73	-1.22A37E-01	-5.53976E-03	-7.1059AE-01	2.03A95E-04	1.54220E-02
74	-1.21451E-01	-5.53629E-03	-6.97A93E-01	5.239A5E-04	1.52352E-02
75	-1.179A1E-01	-5.53067E-03	-6.73325E-01	A.099AE-04	1.4791A7E-02
76	-1.06145E-01	-5.5217AE-03	-6.41690E-01	9.37085E-04	1.40346E-02
77	-9.71005E-02	-5.51119E-03	-6.074A1E-01	9.60455E-04	1.31619E-02
78	2.74576E-01	-5.75A56E-04	-1.09A66E+00	-2.15342E-03	1.27271E-02
79	2.72714E-01	-6.54192E-04	-1.17451E+00	-2.17A02E-03	1.3A92AE-02
80	2.64054E-01	-7.65411E-04	-1.24A4AE+00	-1.112A7E-03	1.50177E-02
81	2.6537AE-01	-A.46525E-04	-1.30272E+00	-1.2524AE-03	1.5696AE-02
82	2.67690E-01	-1.01404E-03	-1.33932E+00	-7.15747E-04	1.62310E-02
83	2.6055AE-01	-1.15420E-03	-1.354A2E+00	-2.26650E-04	1.634A3E-02
84	2.575A9E-01	-1.2AA62E-03	-1.35553E+00	2.69440E-04	1.64A96E-02
85	2.54172E-01	-1.41600E-03	-1.33457E+00	A.36503E-04	1.62420E-02
86	2.44775E-01	-1.52967E-03	-1.29439E+00	1.473A3E-03	1.59509E-02
87	2.42005E-01	-1.63130E-03	-1.23016E+00	1.95736E-03	1.50917E-02
88	2.31415E-01	-1.70156E-03	-1.15A64E+00	1.99770E-03	1.41923E-02
89	4.82837E-01	7.87298E-03	-1.61357E+00	-3.52503E-03	1.09197E-02
90	4.94457E-01	7.62381E-03	-1.74291E+00	-3.7144AE-03	1.19761E-02
91	5.13132E-01	3.30664E-03	-1.86859E+00	-2.834A1E-03	1.29829E-02
92	5.21156E-01	3.04291E-03	-1.94649E+00	-1.89384E-03	1.35552E-02
93	5.26345E-01	2.762AAE-03	-2.00655E+00	-1.07826E-03	1.40101E-02
94	5.25937E-01	2.50216E-03	-2.02552E+00	-3.75459E-04	1.41524E-02
95	5.25620E-01	2.244A3E-03	-2.073A1E+00	3.08144E-04	1.42746E-02
96	5.14412E-01	1.99697E-03	-2.00217E+00	1.0A393E-03	1.41374E-02
97	5.09515E-01	1.77775E-03	-1.95371E+00	2.0212AE-03	1.39A65E-02
98	4.90564E-01	1.53549E-03	-1.85596E+00	2.99831E-03	1.34A76E-02
99	4.69383E-01	1.35653E-03	-1.75067E+00	2.8A157E-03	1.29599E-02
100	5.74A47E-01	5.61100E-03	-2.00915E+00	-4.54259E-03	6.16001E-03
101	5.95780E-01	5.20322E-03	-2.17506E+00	-4.63350E-03	6.45639E-03
102	6.16387E-01	4.74362E-03	-2.32969E+00	-3.5750AE-03	6.63073E-03
103	6.2AA24E-01	4.3754AE-03	-2.43129E+00	-2.41043E-03	7.09773E-03
104	6.34011E-01	4.01629E-03	-2.50525E+00	-1.40752E-03	7.21267E-03
105	6.40049E-01	3.694A3E-03	-2.57433E+00	-5.47055E-04	7.54240E-03
106	6.41143E-01	3.7A704E-03	-2.54497E+00	2.70049E-04	7.4A914E-03
107	6.37322E-01	3.09A4AE-03	-2.51422E+00	1.135AAE-03	7.71125E-03
108	6.23503E-01	2.8A197E-03	-2.46161E+00	2.1272AE-03	7.69159E-03
109	6.04576E-01	2.57175E-03	-2.36114E+00	3.10097E-03	A.16930E-03
110	5.84742E-01	2.76A25E-03	-2.25031E+00	3.06245E-03	A.50729E-03
111	5.87175E-01	2.14126E-03	-2.10919E+00	-4.50637E-03	-2.21234E-03
112	5.992A2E-01	1.79606E-03	-2.266A5E+00	-4.12284E-03	-4.0299AE-03

113	6.1755AF-01	1.37593E-03	-2.39976E+00	-3.22155E-03	-5.09260E-03
114	6.29746F-01	9.42433E-04	-2.49838E+00	-2.29161E-03	-5.59612E-03
115	6.3421AE-01	4.44195E-04	-2.56524E+00	-1.40710E-03	-5.88246E-03
116	6.40845E-01	0.	-2.60044E+00	-5.87645E-04	-5.9179AL-03
117	6.40597E-01	-3.55005E-05	-2.60809E+00	1.87373E-04	-5.90134E-03
118	6.34704F-01	-9.58896E-05	-2.58723F+00	9.40959E-04	-5.64147E-03
119	6.25431E-01	-1.74597E-04	-2.54114E+00	1.63142E-03	-5.19309E-03
120	6.09541E-01	-2.64254E-04	-2.47296F+00	2.06150E-03	-4.28321E-03
121	5.94446F-01	-1.43074E-04	-2.39720E+00	2.12467E-03	-3.24141E-03
122	6.03984E-01	2.46107E-03	-1.80978F+00	-2.26511E-03	-9.99764E-03
123	6.23707E-01	2.36807E-03	-1.89007E+00	-2.24962E-03	-1.15034E-02
124	6.45191E-01	2.24699E-03	-1.96845E+00	-2.06004E-03	-1.26719E-02
125	6.59558E-01	2.11092E-03	-2.03506F+00	-1.61009E-03	-1.34140E-02
126	6.69177E-01	1.97535E-03	-2.08291E+00	-1.05904E-03	-1.38452E-02
127	6.72424E-01	1.84920E-03	-2.11033E+00	-4.68729F-04	-1.40504E-02
128	6.72164E-01	1.73852E-03	-2.11693E+00	8.87854E-05	-1.40604E-02
129	6.65427E-01	1.64937E-03	-2.10499E+00	5.71892E-04	-1.38735E-02
130	6.55327E-01	1.54444E-03	-2.07740E+00	8.94493E-04	-1.34554E-02
131	6.37621F-01	1.46738E-03	-2.04378E+00	9.91219E-04	-1.23239E-02
132	6.22226E-01	1.44777E-03	-2.00783E+00	9.89085E-04	-1.20933E-02
133	7.29394F-01	-1.00845E-03	-1.25994E+00	-7.18574E-04	-1.37322E-02
134	7.59121E-01	-1.00635E-03	-1.28720E+00	-8.47627E-04	-1.45953E-02
135	7.90911F-01	-1.01045E-03	-1.32073E+00	-9.87159E-04	-1.54316E-02
136	8.12424F-01	-1.02319E-03	-1.35520E+00	-8.98291E-04	-1.60963E-02
137	8.26350E-01	-1.04294E-03	-1.38324E+00	-6.48029E-04	-1.65529E-02
138	8.31860F-01	-1.06553E-03	-1.40085E+00	-3.24202E-04	-1.67339E-02
139	8.17122E-01	-1.08761E-03	-1.40663E+00	-5.59890E-06	-1.67499E-02
140	8.23744E-01	-1.10642E-03	-1.40236E+00	2.27613E-04	-1.65952E-02
141	8.09399E-01	-1.11938E-03	-1.39224E+00	3.09907E-04	-1.62476E-02
142	7.86751E-01	-1.19507E-03	-1.38190E+00	2.63501E-04	-1.58044E-02
143	7.67049E-01	-1.17499E-03	-1.37354E+00	2.22744E-04	-1.53309E-02
144	9.73252F-01	-5.60747E-03	-6.50633E-01	3.74121E-05	-1.40935E-02
145	1.01303E+00	-5.58630E-03	-6.49794E-01	-2.40339E-05	-1.45949E-02
146	1.05582F+00	-5.54364E-03	-6.53006E-01	-1.79275F-04	-1.51510E-02
147	1.04741E+00	-5.47704E-03	-6.61855F-01	-2.99813F-04	-1.56649E-02
148	1.10797E+00	-5.39835F-03	-6.72749E-01	-2.93181F-04	-1.60316E-02
149	1.11594F+00	-5.31460E-03	-6.81697E-01	-1.96850F-04	-1.62213E-02
150	1.11705F+00	-5.23115F-03	-6.86744E-01	-8.46955E-05	-1.62412E-02
151	1.10664F+00	-5.15235F-03	-6.88932E-01	-4.25166F-05	-1.61149E-02
152	1.08744E+00	-5.08360E-03	-6.91178E-01	-8.95181F-05	-1.58839E-02
153	1.05911E+00	-5.03357F-03	-6.96246F-01	-1.79473F-04	-1.56189E-02
154	1.03416E+00	-5.00247E-03	-7.03940E-01	-2.22147E-04	-1.53557E-02
155	1.21219E+00	-1.04330F-02	-1.29199F-01	4.85310F-04	-1.16891E-02
156	1.33123E+00	-1.04142E-02	-1.11937E-01	4.47903E-04	-1.20090E-02
157	1.34417F+00	-1.03614E-02	-9.77327E-02	3.05404E-04	-1.23192E-02
158	1.42551F+00	-1.02609F-02	-9.09737E-02	1.14646E-04	-1.26232E-02
159	1.45339E+00	-1.01283E-02	-8.84508E-02	-1.81927E-05	-1.28951E-02
160	1.46654E+00	-9.98038F-03	-9.03810E-02	-8.32032E-05	-1.30449E-02
161	1.46737E+00	-9.83295E-03	-9.41447E-02	-1.26321E-04	-1.30890E-02
162	1.45498E+00	-9.69922E-03	-9.9997E-02	-1.93767F-04	-1.30398E-02
163	1.43187E+00	-9.59137E-03	-1.08696E-01	-2.89914F-04	-1.29429E-02
164	1.39958E+00	-9.52051E-03	-1.20991E-01	-3.72989E-04	-1.28554E-02
165	1.37133F+00	-9.48217E-03	-1.35296E-01	-4.00928E-04	-1.27931E-02
166	1.56213E+00	-1.42292E-02	2.11410E-01	7.28593E-04	-7.10512E-03
167	1.61842F+00	-1.42178E-02	2.36958E-01	6.57609E-04	-7.19333E-03
168	1.67690E+00	-1.41635E-02	2.57911E-01	4.90612E-04	-7.25655E-03
169	1.72396E+00	-1.40517E-02	2.72382E-01	3.08038E-04	-7.34105E-03
170	1.75725E+00	-1.38976E-02	2.80545E-01	1.45292E-04	-7.45313E-03
171	1.77474E+00	-1.37207E-02	2.83320E-01	1.16854E-05	-7.55757E-03
172	1.77685E+00	-1.35425E-02	2.81618E-01	-1.05294E-04	-7.62378E-03
173	1.76479E+00	-1.33825E-02	2.75728E-01	-2.17785E-04	-7.66223E-03
174	1.74043F+00	-1.32565E-02	2.65958E-01	-3.15603E-04	-7.69832E-03
175	1.71902E+00	-1.31751E-02	2.53298E-01	-3.69886E-04	-7.76643E-03
176	1.64051E+00	-1.3106F-02	2.39624E-01	-3.78918E-04	-7.86136E-03

177	1.73446E+00	-1.54652E-02	3.43044E-01	6.9A359E-04	-1.14411E-03
178	1.74047E+00	-1.54507E-02	3.67195E-01	6.09142E-04	-9.24424E-04
179	1.81640E+00	-1.57949E-02	3.86044E-01	4.46923E-04	-7.45757E-04
180	1.86240E+00	-1.56869E-02	3.99730E-01	3.13912E-04	-6.33459E-04
181	1.99706E+00	-1.55392E-02	4.08763E-01	1.87441E-04	-5.94472E-04
182	1.91615E+00	-1.53674E-02	4.13249E-01	6.31027E-05	-6.16230E-04
183	1.92073E+00	-1.51425E-02	4.13376E-01	-5.53504E-05	-6.72496E-04
184	1.91049E+00	-1.50349E-02	4.09410E-01	-1.61492E-04	-7.61977E-04
185	1.84932E+00	-1.49101E-02	4.02096E-01	-2.30231E-04	-8.84054E-04
186	1.86097E+00	-1.49275E-02	3.92471E-01	-2.62881E-04	-1.04197E-03
187	1.87931E+00	-1.47785E-02	3.83530E-01	-2.56155E-04	-1.21534E-03
188	1.62404E+00	-1.47614E-02	3.02242E-01	4.34996E-04	5.04673E-03
189	1.66604E+00	-1.47712E-02	3.17195E-01	3.81604E-04	5.55942E-03
190	1.71106E+00	-1.46767E-02	3.29737E-01	2.89007E-04	5.90545E-03
191	1.74974E+00	-1.45866E-02	3.34040E-01	2.18124E-04	6.14460E-03
192	1.77986E+00	-1.44663E-02	3.44519E-01	1.44289E-04	6.29660E-03
193	1.79764E+00	-1.43260E-02	3.44223E-01	6.35902E-05	6.36044E-03
194	1.80334E+00	-1.41417E-02	3.49051E-01	-1.75253E-05	6.34693E-03
195	1.79637E+00	-1.40496E-02	3.47113E-01	-8.95006E-05	6.25960E-03
196	1.74031E+00	-1.39427E-02	3.43000E-01	-1.34085E-04	6.11424E-03
197	1.75461E+00	-1.38613E-02	3.37442E-01	-1.43938E-04	5.93667E-03
198	1.74286E+00	-1.38194E-02	3.33017E-01	-1.30610E-04	5.76470E-03
199	1.24337E+00	-1.11434E-02	1.70519E-01	1.56054E-04	1.05670E-02
200	1.33407E+00	-1.11434E-02	1.76025E-01	1.53414E-04	1.10402E-02
201	1.33330E+00	-1.10944E-02	1.81124E-01	1.34755E-04	1.14031E-02
202	1.36034E+00	-1.10336E-02	1.85797E-01	1.05391E-04	1.16912E-02
203	1.34220E+00	-1.09495E-02	1.84434E-01	7.32578E-05	1.14143E-02
204	1.37562E+00	-1.09517E-02	1.90347E-01	3.57263E-05	1.20364E-02
205	1.41056E+00	-1.07500E-02	1.90932E-01	-3.19964E-06	1.20671E-02
206	1.39652E+00	-1.06546E-02	1.90214E-01	-3.77913E-05	1.20041E-02
207	1.34613E+00	-1.05742E-02	1.88496E-01	-6.06105E-05	1.11734E-02
208	1.37179E+00	-1.05141E-02	1.86743E-01	-5.96540E-05	1.17051E-02
209	1.36259E+00	-1.04695E-02	1.84495E-01	-4.96272E-05	1.15743E-02
210	7.10906E-01	-6.01919E-03	4.40027E-02	3.04796E-05	1.44342E-02
211	7.15846E-01	-5.98155E-03	4.51350E-02	3.58382E-05	1.46544E-02
212	7.29804E-01	-5.94724E-03	4.63443E-02	3.52453E-05	1.49721E-02
213	7.41511E-01	-5.90554E-03	4.74070E-02	2.62414E-05	1.52694E-02
214	7.54840E-01	-5.85500E-03	4.81420E-02	1.82012E-05	1.55116E-02
215	7.61491E-01	-5.79766E-03	4.86099E-02	8.73807E-06	1.56678E-02
216	7.64665E-01	-5.73780E-03	4.87364E-02	-1.22503E-06	1.57166E-02
217	7.62799E-01	-5.67974E-03	4.85670E-02	-1.01414E-05	1.56724E-02
218	7.57744E-01	-5.62733E-03	4.81513E-02	-1.55262E-05	1.55574E-02
219	7.51639E-01	-5.58303E-03	4.76673E-02	-1.44640E-05	1.54029E-02
220	7.46602E-01	-5.54481E-03	4.72544E-02	-1.17640E-05	1.53062E-02
221	0.	0.	0.	0.	1.58636E-02
222	0.	0.	0.	0.	1.59131E-02
223	0.	0.	0.	0.	1.62094E-02
224	0.	0.	0.	0.	1.65061E-02
225	0.	0.	0.	0.	1.67527E-02
226	0.	0.	0.	0.	1.69064E-02
227	0.	0.	0.	0.	1.69676E-02
228	0.	0.	0.	0.	1.69276E-02
229	0.	0.	0.	0.	1.64193E-02
230	0.	0.	0.	0.	1.66660E-02
231	0.	0.	0.	0.	1.65840E-02

MEMBER NO.	MOMENTS		SHEAR	AXIAL FORCE	ULT. MOM.	KJ/PM	KA/PM	ULT. FORCE
	MOM. AT J END	MOM. AT K END						
1	0.	0.	0.	0.	347.141	0.	0.	0.
2	0.	0.	0.	0.	347.141	0.	0.	0.
3	0.	0.	0.	0.	347.141	0.	0.	0.
4	0.	0.	0.	0.	347.141	0.	0.	0.
5	0.	0.	0.	0.	347.141	0.	0.	0.
6	0.	0.	0.	0.	347.141	0.	0.	0.
7	0.	0.	0.	0.	347.141	0.	0.	0.
8	0.	0.	0.	0.	347.141	0.	0.	0.
9	0.	0.	0.	0.	347.141	0.	0.	0.
10	0.	0.	0.	0.	347.141	0.	0.	0.
11	-4.36171E+01	-1.50774E+01	6.16501E-01	1.69271E+00	270.000	-0.162	-0.056	0.055
12	2.97174E-03	-1.57314E-03	-7.75063E-05	4.04116E-02	10.000	0.000	-0.000	0.000
13	-2.25256E-03	7.3445E-04	5.10072E-05	1.20677E-02	10.000	-0.000	0.000	0.000
14	1.94734E+02	-1.64239E+02	-7.45562E+00	2.94464E+00	540.000	0.369	-0.704	0.049
15	3.22279E-03	-2.05787E-03	-9.00609E-05	4.02174E-02	10.000	0.000	-0.000	0.000
16	-2.17419E-03	7.44411E-04	4.91577E-05	8.90924E-03	10.000	-0.000	0.000	0.000
17	2.12277E+02	-1.68024E+02	-7.99901E+00	2.94754E+00	540.000	0.374	-0.711	0.051
18	3.04645E-07	-2.26176E-07	-9.12062E-05	4.04702E-02	10.000	0.000	-0.000	0.000
19	-1.92676E-07	9.16140E-04	4.44729E-05	9.04500E-03	10.000	-0.000	0.000	0.000
20	1.91210E+02	-1.65270E+02	-7.70145E+00	3.05171E+00	540.000	0.354	-0.706	0.051
21	2.49377E-03	-2.37243E-03	-8.98134E-05	4.04469E-02	10.000	0.000	-0.000	0.000
22	-1.74564E-03	1.06458E-03	4.79925E-05	9.44322E-03	10.000	-0.000	0.000	0.000
23	1.79526E+02	-1.61631E+02	-7.37087E+00	3.17919E+00	540.000	0.332	-0.699	0.051
24	2.03690E-03	-2.42644E-03	-4.63615E-05	4.05739E-02	10.000	0.000	-0.000	0.000
25	-1.51344E-03	1.16539E-03	4.56397E-05	1.04634E-02	10.000	-0.000	0.000	0.000
26	1.62790E+02	-1.54517E+02	-6.45556E+00	3.15351E+00	540.000	0.361	-0.696	0.051
27	2.43273E-03	-2.50972E-03	-4.42027E-05	4.01232E-02	10.000	0.000	-0.000	0.000
28	-1.31564E-03	1.24791E-03	4.37911E-05	1.14672E-02	10.000	-0.000	0.000	0.000
29	1.46976E+02	-1.46474E+02	-6.34476E+00	3.14532E+00	540.000	0.272	-0.670	0.051
30	2.14421E-03	-2.61102E-03	-4.17416E-05	3.91693E-02	10.000	0.000	-0.000	0.000
31	-1.36474E-03	1.32056E-03	4.06690E-05	1.17855E-02	10.000	-0.000	0.000	0.000
32	1.24765E+02	-1.34804E+02	-5.59944E+00	3.07330E+00	540.000	0.230	-0.650	0.050
33	1.95049E-07	-2.90649E-07	-7.90634E-05	3.44404E-02	10.000	0.000	-0.000	0.000
34	-8.94044E-04	1.47741E-03	4.07406E-05	1.15510E-02	10.000	-0.000	0.000	0.000
35	1.02944E+02	-1.27642E+02	-4.37492E+00	3.07049E+00	540.000	0.191	-0.627	0.051
36	1.69177E-07	-2.62576E-07	-7.36256E-05	3.74005E-02	10.000	0.000	-0.000	0.000
37	-7.74737E-04	1.64742E-03	4.13741E-05	1.14129E-02	10.000	-0.000	0.000	0.000
38	8.23624E+01	-1.10225E+02	-4.16490E+00	2.92021E+00	540.000	0.153	-0.604	0.047
39	1.69117E-07	-2.57934E-07	-7.24425E-05	3.76056E-02	10.000	0.000	-0.000	0.000
40	-9.24497E-04	1.41246E-03	4.66411E-05	1.07474E-02	10.000	-0.000	0.000	0.000
41	4.24409E+01	-5.50104E+01	-2.10547E+00	1.49047E+00	270.000	0.157	-0.644	0.071
42	2.04177E-07	-1.70056E-07	-5.30194E-07	4.10705E-07	0.000	0.000	-0.000	0.000
43	-1.60174E-01	-1.3579E-01	8.43296E-04	-2.91147E-02	0.000	-0.000	-0.000	0.000
44	-1.31921E-01	-1.15744E-01	4.44245E-04	-7.76642E-02	0.000	-0.000	-0.000	0.000
45	-1.10707E-01	-9.74911E-02	3.55474E-04	-9.22233E-02	0.000	-0.000	-0.000	0.000
46	-9.12050E-02	-9.44032E-02	-7.45474E-05	-7.99372E-02	0.000	-0.000	-0.000	0.000
47	-4.59954E-02	-1.07679E-01	-6.01200E-04	-1.00329E-01	0.000	-0.000	-0.000	0.000
48	-9.44342E-02	-1.29720E-01	-4.68431E-04	-9.33542E-02	0.000	-0.000	-0.000	0.000
49	-1.19500E-01	-4.70647E-02	9.70351E-04	-7.93609E-02	0.000	-0.000	-0.000	0.000
50	-7.59477E-02	-1.07444E-02	1.81236E-03	-5.93454E-02	0.000	-0.000	-0.000	0.000
51	-1.64762E-04	-3.44166E-04	-6.09455E-06	-3.93420E-02	0.000	-0.000	-0.000	0.000
52	-4.20861E+01	-3.44421E+01	4.42962E-01	1.76790E+00	270.000	-0.304	-0.142	0.057
53	1.01540E-02	-1.54627E-02	-5.97232E-04	5.44334E-02	10.000	0.000	-0.000	0.000
54	4.44751E-07	-1.25597E-02	-3.65053E-04	5.99170E-04	10.000	0.000	-0.000	0.000
55	3.71006E+02	-2.77909E+02	-1.25777E+01	3.17137E+00	540.000	0.557	-0.815	0.051
56	2.04913E-02	-1.79017E-02	-6.54327E-04	5.90202E-02	10.000	0.000	-0.000	0.000
57	9.40241E-07	-1.24539E-02	-3.79523E-04	-7.02913E-03	10.000	0.000	-0.000	0.000
58	3.05255E+02	-2.84921E+02	-1.27510E+01	3.19377E+00	540.000	0.565	-0.801	0.052
59	2.02412E-02	-1.84526E-02	-6.60632E-04	5.59491E-02	10.000	0.000	-0.000	0.000
60	1.10515E-07	-1.36637E-02	-4.21459E-04	-2.50441E-03	10.000	0.000	-0.000	0.000
61	3.03849E+02	-2.44979E+02	-1.28092E+01	3.26554E+00	540.000	0.563	-0.835	0.051
62	1.94651E-02	-1.47301E-02	-6.58254E-04	5.10174E-02	10.000	0.000	-0.000	0.000
63	1.24773E-02	-1.43049E-02	-4.50783E-04	2.74409E-03	10.000	0.000	-0.000	0.000
64	3.01436E+02	-2.91254E+02	-1.24055E+01	3.36054E+00	540.000	0.554	-0.839	0.055
65	1.49107E-02	-1.44434E-02	-6.37074E-04	4.44874E-02	10.000	0.000	-0.000	0.000

66	1.19331E-02	-1.59254E-02	-4.93446E-04	1.00940E-02	10.000	.001	-.002	.001
67	2.95497E+02	-2.90422E+02	-1.26677E+01	3.37542E+00	540.000	.541	-.079	.004
68	1.79799E-02	-1.1546E-02	-6.16267E-04	3.92492E-02	10.000	.002	-.002	.002
69	1.49545E-02	-1.53269E-02	-5.14702E-04	1.53896E-02	10.000	.001	-.002	.002
70	2.48693E+02	-2.87158E+02	-1.24416E+01	3.36756E+00	540.000	.535	-.532	.002
71	1.64741E-02	-1.74309E-02	-5.78237E-04	3.14696E-02	10.000	.002	-.002	.002
72	1.58177E-02	-1.56131E-02	-5.36020E-04	2.21166E-02	10.000	.002	-.002	.002
73	2.76247E+02	-2.79802E+02	-1.20137E+01	3.23734E+00	540.000	.512	-.518	.002
74	1.49454E-02	-1.66557E-02	-5.78935E-04	2.65622E-02	10.000	.001	-.002	.002
75	1.62819E-02	-1.52894E-02	-5.38430E-04	2.64431E-02	10.000	.002	-.002	.002
76	2.60556E+02	-2.69740E+02	-1.14573E+01	3.22910E+00	540.000	.483	-.500	.002
77	1.32032E-02	-1.53634E-02	-4.97170E-04	2.09797E-02	10.000	.001	-.002	.002
78	1.65390E-02	-1.46962E-02	-5.32714E-04	3.08359E-02	10.000	.002	-.002	.002
79	2.42790E+02	-2.57907E+02	-1.08174E+01	3.11614E+00	540.000	.450	-.474	.002
80	1.29775E-02	-1.50943E-02	-4.78737E-04	2.45620E-02	10.000	.001	-.002	.002
81	1.53716E-02	-1.72323E-02	-4.97819E-04	2.70905E-02	10.000	.002	-.002	.002
82	1.17699E+02	-1.25706E+02	-5.25487E+00	1.58646E+00	270.000	.436	-.466	.002
83	3.15919E-02	-4.51772E-01	-1.34263E-02	-5.23209E-02	694.363	.007	-.001	.001
84	-4.54772E-01	-4.49966E-01	1.22402E-04	-8.91074E-02	694.363	-.001	-.001	.001
85	-4.63710E-01	-3.78995E-01	2.35318E-03	-1.24156E-01	694.363	-.001	-.001	.001
86	-3.94774E-01	-3.71262E-01	4.16569E-04	-1.43912E-01	694.363	-.001	-.001	.001
87	-3.76446E-01	-3.07335E-01	1.91974E-03	-1.61325E-01	694.363	-.001	-.001	.001
88	-3.79732E-01	-3.97398E-01	-7.44889E-03	-1.61461E-01	694.363	-.001	-.001	.001
89	-3.94522E-01	-4.23674E-01	-3.39479E-04	-1.49050E-01	694.363	-.001	-.001	.001
90	-4.15290E-01	-3.76152E-01	1.08716E-03	-1.24111E-01	694.363	-.001	-.001	.001
91	-3.67970E-01	9.33440E-03	1.03695E-02	-3.83595E-02	694.363	-.001	-.001	.001
92	2.23799E-02	4.34790E-03	-7.49751E-04	-5.00239E-02	694.363	.000	.000	.001
93	-1.04141E+02	-4.98799E+01	1.17345E+00	1.77261E+00	270.000	-.356	-.195	.001
94	3.15176E-02	-3.66758E-02	-1.78263E-03	8.44526E-02	10.000	.004	-.004	.001
95	2.35935E-02	-2.67165E-02	-4.49721E-04	-2.14653E-02	10.000	.002	-.002	.001
96	3.27162E+02	-1.23353E+02	-1.40526E+01	3.26334E+00	540.000	.603	-.571	.001
97	4.21164E-02	-4.08306E-02	-1.41489E-03	9.72919E-02	10.000	.004	-.004	.001
98	7.57970E-02	-2.87149E-02	-9.29410E-04	-3.86094E-02	10.000	.004	-.004	.001
99	3.40745E+02	-3.35093E+02	-1.46019E+01	3.72544E+00	540.000	.631	-.621	.001
100	4.23930E-02	-4.17029E-02	-1.43443E-03	7.96527E-02	10.000	.004	-.004	.001
101	2.76767E-02	-3.14477E-02	-1.04839E-03	-2.50691E-02	10.000	.003	-.003	.001
102	3.46441E+02	-3.42899E+02	-1.44937E+01	3.40979E+00	540.000	.642	-.635	.001
103	4.22137E-02	-4.18959E-02	-1.43460E-03	6.71232E-02	10.000	.004	-.004	.001
104	7.75111E-02	-3.43931E-02	-1.14447E-03	-1.12547E-02	10.000	.003	-.003	.001
105	7.50359E+02	-3.47905E+02	-1.50965E+01	3.50970E+00	540.000	.649	-.644	.001
106	4.19403E-02	-4.04409E-02	-1.39441E-03	4.98552E-02	10.000	.004	-.004	.001
107	7.56598E-02	-3.69861E-02	-1.23714E-03	6.47464E-03	10.000	.004	-.004	.001
108	3.51923E+02	-3.49984E+02	-1.23714E-03	3.52715E+00	540.000	.652	-.644	.001
109	3.95677E-02	-3.96232E-02	-1.51653E+01	3.60817E-02	10.000	.004	-.004	.001
110	7.71086E-02	-3.83771E-02	-1.35049E-03	2.07119E-02	10.000	.004	-.004	.001
111	7.51410E+02	-7.49154E+02	-1.29060E-03	3.51777E+00	540.000	.651	-.647	.001
112	7.68911E-02	-3.73071E-02	-1.51363E+01	1.75969E-02	10.000	.004	-.004	.001
113	3.41145E-02	-3.97717E-02	-1.26535E-03	3.44954E-02	10.000	.004	-.004	.001
114	3.47045E+02	-3.44798E+02	-1.49478E+01	3.43001E+00	540.000	.643	-.639	.001
115	3.19215E-02	-3.44242E-02	-1.17231E-03	3.36247E-03	10.000	.003	-.003	.001
116	3.93166E-02	-3.94747E-02	-1.75065E-03	5.16423E-02	10.000	.004	-.004	.001
117	7.83309E+02	-3.36873E+02	-1.45874E+01	3.36034E+00	540.000	.626	-.624	.001
118	3.03122E-02	-3.16059E-02	-1.05053E-03	-1.07152E-02	10.000	.003	-.003	.001
119	7.96365E-02	-3.91673E-02	-1.34403E-03	6.44494E-02	10.000	.004	-.004	.001
120	7.25071E+02	-3.26434E+02	-1.40753E+01	3.73902E+00	540.000	.602	-.605	.001
121	2.91944E-02	-3.06010E-02	-1.91965E-03	-3.33313E-03	10.000	.003	-.003	.001
122	3.71971E-02	-3.58524E-02	-1.24576E-03	5.68723E-02	10.000	.004	-.004	.001
123	1.56494E+02	-1.58360E+02	-6.80259E+00	1.61821E+00	270.000	.580	-.587	.001
124	7.49641E-02	-7.54932E-01	-7.17750E-02	-5.75506E-02	694.363	.000	-.001	.001
125	-7.69227E-01	-7.59961E-01	2.57391E-04	-1.08484E-01	694.363	-.001	-.001	.001
126	-7.91764E-01	-6.35577E-01	4.06084E-03	-1.46793E-01	694.363	-.001	-.001	.001
127	-6.50492E-01	-5.44735E-01	7.84799E-03	-1.75154E-01	694.363	-.001	-.001	.001
128	-5.56513E-01	-4.32270E-01	7.45117E-03	-1.49141E-01	694.363	-.001	-.001	.001
129	-4.33347E-01	-5.44264E-01	-3.19098E-03	-1.49133E-01	694.363	-.001	-.001	.001

130	-5.42316E-01	-6.81746E-01	-3.47417E-03	-1.75031E-01	694.363	-.001	-.001	-.0012
131	-6.64749E-01	-7.09034E-01	-1.11791E-03	-1.46264E-01	694.363	-.001	-.001	-.0012
132	-6.39042E-01	-1.76259E-01	1.42674E-02	-1.07392E-01	694.363	-.001	-.001	-.0011
133	-1.55747E-01	1.39160E-02	4.70177E-03	-5.55964E-02	694.363	-.000	-.000	-.0011
134	-9.41505E+01	-5.45415E+01	9.44911E-01	1.64444E+00	270.000	-.364	-.202	-.0006
135	4.44519E-02	-5.19540E-02	-1.71975E-03	1.22746E-01	10.000	.005	-.005	-.012
136	3.74675E-02	-3.12098E-02	-1.10269E-03	-6.79735E-02	10.000	.003	-.003	-.017
137	3.06170E+02	-3.21722E+02	-1.35662E+01	3.26454E+00	540.000	.567	-.596	-.0007
138	5.41213E-02	-5.70524E-02	-1.19661E-03	1.31193E-01	10.000	.005	-.006	-.011
139	3.66420E-02	-3.56023E-02	-1.23166E-03	-7.76620E-02	10.000	.004	-.004	-.014
140	3.27744E+02	-3.37918E+02	-1.43121E+01	3.39400E+00	540.000	.607	-.676	-.055
141	5.51162E-02	-5.77642E-02	-1.92565E-03	1.07453E-01	10.000	.006	-.006	-.011
142	4.22176E-02	-4.17246E-02	-1.42439E-03	-5.21554E-02	10.000	.004	-.004	-.015
143	3.40256E+02	-3.44666E+02	-1.44447E+01	3.44174E+00	540.000	.630	-.646	-.057
144	5.54997E-02	-5.73543E-02	-1.92499E-03	4.44322E-02	10.000	.006	-.006	-.014
145	4.63715E-02	-4.54249E-02	-1.57207E-03	-2.77413E-02	10.000	.005	-.005	-.013
146	3.50239E+02	-3.55475E+02	-1.52476E+01	3.54482E+00	540.000	.649	-.659	-.054
147	5.47907E-02	-5.53057E-02	-1.47095E-03	5.52169E-02	10.000	.005	-.005	-.016
148	5.01054E-02	-5.01013E-02	-1.70442E-03	2.74307E-03	10.000	.005	-.005	-.010
149	3.57029E+02	-3.59271E+02	-1.54763E+01	3.60491E+00	540.000	.661	-.665	-.059
150	5.72211E-02	-5.30600E-02	-1.41256E-03	3.14675E-02	10.000	.005	-.005	-.013
151	5.20496E-02	-5.30403E-02	-1.79223E-03	2.62179E-02	10.000	.005	-.005	-.013
152	3.61957E+02	-3.60234E+02	-1.56036E+01	3.59941E+00	540.000	.670	-.657	-.056
153	5.03435E-02	-4.93410E-02	-1.69490E-03	4.15059E-04	10.000	.003	-.003	-.017
154	5.17944E-02	-5.59734E-02	-1.47226E-03	5.65112E-02	10.000	.005	-.006	-.010
155	3.63674E+02	-3.54237E+02	-1.55976E+01	3.50069E+00	540.000	.673	-.653	-.057
156	4.70325E-02	-4.57415E-02	-1.57579E-03	-2.43708E-02	10.000	.005	-.005	-.012
157	5.41262E-02	-5.74073E-02	-1.90245E-03	4.04699E-02	10.000	.005	-.006	-.014
158	3.61727E+02	-3.52293E+02	-1.54269E+01	3.41405E+00	540.000	.670	-.652	-.057
159	4.23774E-02	-4.05643E-02	-1.41416E-03	-4.96415E-02	10.000	.004	-.004	-.010
160	5.44046E-02	-5.75763E-02	-1.40954E-03	1.04421E-01	10.000	.005	-.006	-.010
161	3.57163E+02	-3.42619E+02	-1.50371E+01	3.27139E+00	540.000	.654	-.635	-.053
162	4.71012E-02	-3.44046E-02	-1.74197E-03	-4.20035E-02	10.000	.004	-.004	-.014
163	5.10467E-02	-5.37492E-02	-1.77495E-03	9.43473E-02	10.000	.005	-.005	-.014
164	1.70516E+02	-1.65714E+02	-7.26444E+00	1.56107E+00	270.000	.632	-.614	-.051
165	6.52796E-02	-6.37391E-02	-1.74466E-02	-5.37400E-02	694.363	.001	-.001	-.011
166	-6.66794E-01	-4.4452E-01	-4.44606E-03	-9.76749E-02	694.363	-.001	-.001	-.011
167	-4.70357E-01	-5.39243E-01	9.19645E-03	-1.34773E-01	694.363	-.001	-.001	-.011
168	-5.57050E-01	-3.45747E-01	5.46950E-03	-1.57421E-01	694.363	-.001	-.001	-.012
169	-3.55249E-01	-1.19645E-01	6.54450E-03	-1.64444E-01	694.363	-.001	-.001	-.012
170	-1.21022E-01	-2.30140E-01	-3.07213E-03	-1.64560E-01	694.363	-.000	-.000	-.012
171	-2.23375E-01	-4.36216E-01	-5.91222E-03	-1.57223E-01	694.363	-.001	-.001	-.012
172	-4.21052E-01	-4.14461E-01	-1.10507E-02	-1.34821E-01	694.363	-.001	-.001	-.012
173	-7.46711E-01	-4.54556E-01	9.44762E-03	-9.77626E-02	694.363	-.001	-.001	-.011
174	-4.29376E-01	1.3452E-01	1.23142E-02	-5.30440E-02	694.363	-.001	-.001	-.011
175	-6.42174E+01	-5.38094E+01	2.24467E-01	1.47073E+00	270.000	-.238	-.199	-.048
176	4.49399E-02	-5.37149E-02	-1.64424E-03	1.55614E-01	10.000	.004	-.005	-.016
177	3.34144E-02	-2.50714E-02	-9.97016E-04	-1.04916E-01	10.000	.003	-.003	-.010
178	2.39152E+02	-2.74571E+02	-1.10992E+01	3.19259E+00	540.000	.443	-.514	-.052
179	4.97403E-02	-5.7976E-02	-1.43746E-03	1.66601E-01	10.000	.005	-.006	-.017
180	3.58492E-02	-2.44514E-02	-1.10463E-03	-1.12437E-01	10.000	.004	-.003	-.011
181	2.64779E+02	-2.93395E+02	-1.20727E+01	3.34441E+00	540.000	.493	-.544	-.055
182	5.95483E-02	-5.71939E-02	-1.43874E-03	1.31107E-01	10.000	.005	-.006	-.013
183	4.13653E-02	-3.56872E-02	-1.31364E-03	-7.52217E-02	10.000	.004	-.004	-.013
184	2.45274E+02	-3.04030E+02	-1.24188E+01	3.44200E+00	540.000	.529	-.570	-.057
185	5.14242E-02	-5.55256E-02	-1.42442E-03	9.47424E-02	10.000	.005	-.006	-.010
186	4.44531E-02	-4.04911E-02	-1.46194E-03	-4.13299E-02	10.000	.004	-.004	-.014
187	3.03536E+02	-3.17242E+02	-1.34171E+01	3.59444E+00	540.000	.562	-.544	-.058
188	5.74934E-02	-5.23340E-02	-1.75344E-03	5.96069E-02	10.000	.005	-.005	-.016
189	4.42743E-02	-4.60352E-02	-1.60432E-03	-2.21254E-04	10.000	.003	-.003	-.010
190	3.15459E+02	-3.22465E+02	-1.34002E+01	3.63479E+00	540.000	.545	-.544	-.059
191	4.99337E-02	-4.94393E-02	-1.69473E-03	2.42442E-02	10.000	.005	-.005	-.013
192	4.94004E-02	-4.96743E-02	-1.69657E-03	3.02521E-02	10.000	.005	-.005	-.013
193	3.26604E+02	-3.26166E+02	-1.41036E+01	3.60844E+00	540.000	.605	-.604	-.051

194	4.76441E-02	-4.50274E-02	-1.58023E-03	-1.28862E-02	10.000	.003	-.005	-.001
195	5.15545E-02	-5.34036E-02	-1.79712E-03	7.06393E-02	10.000	.005	-.005	.007
196	3.34391E+02	-3.27256E+02	-1.42954E+01	3.50402E+00	540.000	.619	-.006	.057
197	4.55014E-02	-4.07288E-02	-1.47024E-03	-4.71553E-02	10.000	.005	-.004	-.005
198	5.15371E-02	-5.67957E-02	-1.44794E-03	1.03373E-01	10.000	.005	-.005	.010
199	3.40705E+02	-3.24425E+02	-1.43792E+01	3.40443E+00	540.000	.631	-.002	.055
200	4.14049E-02	-1.53450E-02	-1.30851E-03	-8.39655E-02	10.000	.004	-.004	-.004
201	5.17925E-02	-5.49718E-02	-1.44967E-03	1.38031E-01	10.000	.005	-.005	.014
202	3.34001E+02	-3.17006E+02	-1.41690E+01	3.21797E+00	540.000	.627	-.547	.052
203	3.94344E-02	-3.25525E-02	-1.22726E-03	-7.49561E-02	10.000	.004	-.003	-.003
204	4.13008E-02	-5.56990E-02	-1.77558E-03	1.24487E-01	10.000	.005	-.006	.013
205	1.64750E+02	-1.52549E+02	-6.45526E+00	1.41179E+00	273.000	.610	-.505	.046
206	-1.14913E-02	-1.11424E-01	-2.77601E-03	-4.15264E-02	694.363	-.000	-.000	-.001
207	-1.47347E-01	-5.21748E-01	-1.04000E-02	-6.85154E-02	694.363	-.000	-.001	-.001
208	-5.46165E-01	3.47475E-01	2.48233E-02	-8.74113E-02	694.363	-.001	.001	-.001
209	3.70240E-01	3.38504E-01	2.24532E-04	-9.83219E-02	694.363	.000	.000	-.001
210	3.29116E-01	4.61020E-01	1.47195E-02	-1.02049E-01	694.363	.000	.001	-.001
211	4.79156E-01	5.82463E-01	-7.11644E-03	-1.01032E-01	694.363	.001	.001	-.001
212	5.04623E-01	7.19370E-01	3.60407E-03	-9.54230E-02	694.363	.001	.001	-.001
213	7.31921E-01	-3.33695E-01	-2.95004E-02	-8.54467E-02	694.363	.001	-.000	-.001
214	-3.12908E-01	-3.64660E-01	-1.54467E-03	-6.77777E-02	694.363	-.000	-.001	-.001
215	-3.44455E-01	4.61140E-03	9.41849E-03	-4.11646E-02	694.363	-.000	.000	-.001
216	-1.39221E+01	-4.44320E+01	-6.69495E-01	1.20275E+00	270.000	-.052	-.166	.039
217	2.80956E-02	-4.15695E-02	-1.18863E-03	1.72736E-01	10.000	.003	-.004	.017
218	2.34807E-02	-9.92404E-03	-5.69404E-04	-1.27724E-01	10.000	.002	-.001	-.013
219	1.07461E+02	-1.63290E+02	-5.84965E+00	3.05695E+00	540.000	.199	-.302	.050
220	3.14230E-02	-4.40003E-02	-1.28693E-03	1.44451E-01	10.000	.003	-.004	.018
221	2.49107E-02	-1.21741E-02	-6.37213E-04	-1.32592E-01	10.000	.002	-.001	-.013
222	1.33740E+02	-1.45904E+02	-6.90606E+00	3.24491E+00	540.000	.244	-.344	.053
223	3.14779E-02	-4.07346E-02	-1.23472E-03	1.40469E-01	10.000	.003	-.004	.014
224	2.47711E-02	-1.11222E-02	-7.92452E-04	-8.57622E-02	10.000	.003	-.002	-.009
225	1.67717E+02	-2.04657E+02	-4.04454E+00	7.41429E+00	540.000	.311	-.279	.057
226	3.70399E-02	-3.40172E-02	-1.21210E-03	1.03944E-01	10.000	.003	-.004	.011
227	2.94467E-02	-2.26204E-02	-8.95250E-04	-4.71053E-02	10.000	.003	-.002	-.002
228	1.76505E+02	-2.19154E+02	-8.44054E+00	5.51340E+00	540.000	.364	-.406	.057
229	3.22646E-02	-3.39791E-02	-1.12444E-03	5.41207E-02	10.000	.003	-.003	.005
230	3.20949E-02	-2.77663E-02	-1.07083E-03	-4.14131E-04	10.000	.003	-.003	-.005
231	3.16547E-02	-3.27330E-02	-9.59117E-04	3.52340E-01	540.000	.401	-.471	.057
232	3.22546E-02	-3.11740E-02	-1.04145E-03	2.62364E-02	10.000	.003	-.003	.003
233	3.27544E-02	-3.09495E-02	-1.04650E-03	3.15424E-02	10.000	.003	-.003	.003
234	2.33479E+02	-2.75151E+02	-1.01251E+01	3.52431E+00	540.000	.432	-.432	.057
235	3.04265E-02	-2.65497E-02	-9.79040E-04	-1.93222E-02	10.000	.003	-.003	-.002
236	3.41655E-02	-3.53674E-02	-1.18602E-03	7.65049E-02	10.000	.003	-.004	.004
237	2.49775E+02	-2.40829E+02	-1.05994E+01	3.44517E+00	540.000	.463	-.446	.050
238	3.03741E-02	-2.29101E-02	-9.04474E-04	-5.67745E-02	10.000	.003	-.002	-.006
239	3.16470E-02	-3.44024E-02	-1.23574E-03	1.12291E-01	10.000	.003	-.004	.011
240	2.67599E+02	-2.46449E+02	-1.11154E+01	3.31919E+00	540.000	.496	-.457	.054
241	2.47554E-02	-1.79624E-02	-7.49599E-04	-1.01874E-01	10.000	.003	-.002	-.010
242	3.34607E-02	-4.33255E-02	-1.31014E-03	1.54412E-01	10.000	.003	-.004	.015
243	2.79671E+02	-2.44710E+02	-1.13294E+01	3.07239E+00	540.000	.518	-.453	.050
244	2.76099E-02	-1.54304E-02	-7.44053E-04	-1.01567E-01	10.000	.003	-.002	-.010
245	3.04299E-02	-4.25442E-02	-1.25257E-03	1.46262E-01	10.000	.003	-.004	.015
246	1.78191E+02	-1.17414E+02	-5.33091E+00	1.17906E+00	270.000	.512	-.436	.035
247	-1.44437E-02	2.97739E-01	8.67172E-03	-2.34734E-02	694.363	-.000	.000	-.000
248	2.70184E-01	7.15059E-01	1.23575E-02	-2.34374E-02	694.363	.000	.001	-.000
249	6.95344E-01	2.12344E+00	3.96681E-02	-1.73264E-02	694.363	.001	.003	-.000
250	2.10465E+00	1.49889E+00	-1.69657E-02	-9.40015E-03	694.363	.003	.002	-.000
251	1.49131E+00	2.22747E+00	2.04484E-02	-3.95275E-03	694.363	.002	.003	-.000
252	2.22554E+00	1.75172E+00	-1.31616E-02	-2.09539E-03	694.363	.003	.003	-.000
253	1.75573E+00	2.60464E+00	2.37072E-02	-4.56134E-03	694.363	.003	.004	-.000
254	2.61422E+00	1.24123E+00	-3.71745E-02	-1.11560E-02	694.363	.004	.002	-.000
255	1.29654E+00	3.64725E-01	-2.57461E-02	-1.94643E-02	694.363	.002	.001	-.000
256	3.47049E-01	1.17139E-01	-1.07199E-02	-2.19451E-02	694.363	.001	.000	-.000
257	3.76743E+01	-2.46662E+01	-1.34641E+00	4.64454E-01	270.000	.140	-.091	.024

254	1.51000F-01	-1.49929E-02	-3.49645E-04	1.66136F-01	10.000	.000	-.002	.011
254	5.51754E-03	1.19424E-02	1.09521E-04	-1.24297E-01	10.000	.001	-.001	-.014
260	-1.00723E+02	7.22661F+01	2.47324E+00	2.44115E+00	540.000	-.187	-.050	.044
261	7.77234E-01	-1.75038E-02	-3.37424E-04	1.77859E-01	10.000	.000	-.002	.014
262	6.57745E-03	1.16551E-02	4.65570E-05	-1.24202E-01	10.000	.001	-.001	-.013
263	-4.35192E+01	1.38098E+01	2.10283E+00	3.14572E+00	540.000	-.155	-.026	.001
264	5.10447E-03	-1.26498E-02	-3.03567E-04	1.31552E-01	10.000	.001	-.001	.013
265	5.74064E-03	7.47905E-03	7.57747E-05	-7.82165E-02	10.000	.001	-.001	-.004
266	-2.74657E+01	-4.84748E+00	4.10897E-01	3.23177E+00	540.000	-.052	-.016	.053
267	4.47200E-03	4.54000E-03	-2.45839E-04	9.75124E-02	10.000	.000	-.001	.010
268	6.44071E-03	7.73110E-03	-4.60807E-05	-4.24930E-02	10.000	.001	.000	-.004
269	-3.25490F+00	-2.34055E+01	-3.77250F-01	3.33977E+00	540.000	-.015	-.043	.054
270	5.76011E-03	-5.92874E-03	-2.07764E-04	5.30740F-02	10.000	.001	-.001	.005
271	5.60950E-03	-4.01464E-04	-1.02511E-04	2.60627E-03	10.000	.001	-.001	.000
272	3.01917E+01	-3.71342E+01	-1.45461E+00	3.35794E+00	540.000	.056	-.000	.055
273	4.42171E-03	-7.43403E-03	-1.40787E-04	2.61362E-02	10.000	.000	-.000	.003
274	7.04771E-03	-3.01696E-03	-1.71646E-04	2.96514E-02	10.000	.001	-.001	.003
275	3.44267E+01	-4.71636E+01	-1.45746F+00	3.35120E+00	540.000	.072	-.037	.054
276	5.43400E-03	7.91763E-04	-9.62253F-05	-1.66290F-02	10.000	.001	-.000	-.002
277	6.40240E-03	-6.52742E-03	-2.20549F-04	7.19474E-02	10.000	.001	-.001	.007
278	7.68447E+01	-6.23719E+01	-3.00792E+00	3.30567E+00	540.000	.142	-.115	.054
279	5.40226E-03	7.33540E-03	-7.52332F-05	-4.90415E-02	10.000	.001	-.000	-.005
280	7.24664E-03	-4.67417E-03	-2.89323E-04	1.02402E-01	10.000	.001	-.001	.011
281	9.79070F+01	-4.10497E+01	-3.46634E+00	3.17345E+00	540.000	.141	-.150	.054
282	7.40464E-03	6.59079E-03	-2.07613E-05	-9.50445E-02	10.000	.001	-.001	-.011
283	5.43549E-03	-1.50723E-02	-3.39639E-04	1.45043E-01	10.000	.000	-.002	.010
284	1.50670E+02	-1.02196F+02	-5.46320E+00	2.46007E+00	540.000	.273	-.149	.046
285	8.57443E-03	5.56575E-03	-5.12466F-05	-9.92167E-02	10.000	.001	-.001	-.011
286	5.25422F-01	-1.49309E-02	-4.12671E-04	1.37606E-01	10.000	.001	-.002	.014
287	7.41431E+01	-5.79173E+01	-2.73231E+00	4.92605E-01	270.000	.290	-.136	.023
288	-7.45941E-03	-1.27493E-01	-4.90097E-03	-1.45693E-03	694.363	-.000	-.000	-.000
289	-3.74749F-01	5.31674E+01	1.57094E-01	3.07772E-02	694.363	-.000	-.000	-.000
290	5.10445E+00	7.33537E+00	-4.24744E-02	6.70909E-02	694.363	.004	-.001	.001
291	2.27273E+00	4.99026E+00	7.39733F-02	9.30577E-02	694.363	.003	-.001	.001
292	4.94574E+00	1.68226F+00	-9.17637F-02	1.06942E-01	694.363	.007	-.002	.001
293	1.54101E+00	5.94237E+00	9.44427F-02	1.04412E-01	694.363	.002	-.002	.001
294	5.04414E+00	2.64662F+00	-6.77105F-02	9.13305E-02	694.363	.007	-.004	.001
295	2.55174F+00	6.03679E+00	9.40704F-02	7.44543F-02	694.363	.004	-.001	.001
296	6.04563E+00	5.45704E-01	-1.57787F-01	7.70124E-02	694.363	.000	-.001	.001
297	5.54140F-01	-5.91117E-03	-1.55544F-02	4.44543F-04	694.363	.001	-.000	.001
298	4.34047E+01	5.11113F+00	-1.42103F+00	5.41734E-01	270.000	.331	-.119	.014
299	-1.23920E-02	1.74174E-02	7.48752F-04	1.30862E-01	10.000	-.003	.001	.013
300	-2.26171E-02	3.97511E-02	1.06714E-03	-1.01014E-01	10.000	-.002	-.004	-.010
301	-2.74544E+02	7.24626F+02	1.09573F+01	2.50205E+00	540.000	-.516	-.423	.041
302	-3.42874E-02	7.70754F-02	1.13214E-03	1.40453E-01	10.000	-.004	-.003	.014
303	-2.49034E-02	4.53272E-02	1.19727E-03	-9.46124E-02	10.000	-.002	-.005	-.007
304	-2.91139E+02	2.45731E+02	1.15844E+01	7.02745E+00	540.000	-.539	-.454	.043
305	-7.11344F-02	2.41221E-02	1.04502E-03	1.02798E-01	10.000	-.003	-.003	.013
306	-3.24044E-02	4.76993E-02	1.37262F-03	-5.25249E-02	10.000	-.003	-.005	-.005
307	-2.60200E+02	2.37742E+02	1.06512E+01	2.96011E+00	540.000	-.482	-.431	.043
308	-3.74444E-02	3.50293E-02	1.23625E-03	7.92267E-02	10.000	-.004	-.004	.004
309	-2.77464F-02	4.10596E-02	1.20733E-03	-2.75674E-02	10.000	-.003	-.004	-.003
310	-2.60257E+02	2.34641E+02	1.07744E+01	3.16327E+00	540.000	-.482	-.442	.051
311	-3.23056E-02	3.34241E-02	1.12109E-03	4.48432F-02	10.000	-.003	-.003	.004
312	-3.54337E-02	4.21503E-02	1.32305E-03	7.24564E-03	10.000	-.004	-.004	.001
313	-2.30720E+02	2.23146E+02	9.79506F+00	3.00604E+00	540.000	-.426	-.413	.043
314	-3.66243E-02	7.91492E-02	1.29302E-03	2.76713E-02	10.000	-.004	-.004	.003
315	-3.37064E-02	3.59056F-02	1.13600F-03	2.45040E-02	10.000	-.003	-.004	.002
316	-2.74734E+02	2.24219E+02	9.99445F+00	3.16746E+00	540.000	-.434	-.423	.051
317	-3.07193E-02	3.71520F-02	1.15737E-03	-4.27544E-03	10.000	-.003	-.004	-.000
318	-3.49451E-02	7.73452E-02	1.23433E-03	5.60749E-02	10.000	-.003	-.004	.000
319	-2.30244E+02	2.07715E+02	4.80534E+00	2.97504E+00	540.000	-.371	-.344	.044
320	-1.72495E-02	4.22661E-02	1.24432F-03	-2.44147E-02	10.000	-.003	-.004	-.002
321	-2.90069F-02	7.03490F-02	1.01310F-03	7.44494E-02	10.000	-.003	-.004	.007

322	-1.93566E+02	2.01419E+02	1.53174E+00	3.04321E+00	540.000	-0.354	.3/3	.049
323	-2.19725E-02	7.79139E-02	1.05501E-03	-5.95271E-02	10.000	-0.002	.004	-.000
324	-3.31474E-02	2.11165E-02	1.05701E-03	1.06170E-01	13.000	-0.003	.003	.011
325	-1.21908E+02	1.49004E+02	5.87028E+00	2.53927E+00	540.000	-0.226	.277	.041
326	-1.92975E-02	2.95127E-02	1.32167E-04	-6.66721E-02	10.000	-0.002	.003	-.007
327	-2.42814E-02	1.35604E-02	6.45411E-04	9.79905E-02	10.000	-0.002	.031	.010
328	-4.07547E+01	5.59507E+01	2.01918E+00	6.11358E-01	270.000	-0.151	.217	.020
329	2.34970E-03	-2.63178E+00	-7.32253E-02	2.04466E-02	694.363	.000	-.034	.000
330	-2.67067E+00	1.46717E+01	4.80624E-01	8.59454E-02	694.363	-0.004	.021	.001
331	1.46684E+01	-1.84283E+01	-4.51648E-01	1.48687E-01	694.363	.021	-.003	.002
332	-1.34479E+00	1.29619E+01	4.11299E-01	1.81176E-01	694.363	-0.003	.019	.002
333	1.24613E+01	-1.38092E+00	-4.53954E-01	2.07551E-01	694.363	.019	-.005	.003
334	-3.31046E+00	1.26991E+01	4.46657E-01	2.07784E-01	694.363	-0.005	.018	.003
335	1.27006E+01	-2.12534E+00	-4.11133E-01	1.19507E-01	694.363	.018	-.003	.002
336	-2.12303E+00	1.49000E+01	4.72165E-01	1.51542E-01	694.363	-0.003	.021	.002
337	1.49074E+01	-1.58692E+00	-4.58065E-01	8.99241E-02	694.363	.021	-.002	.001
338	-1.57954E+00	-1.41860E-02	4.34211E-02	2.12549E-02	694.363	-0.002	.000	.000
339	1.44591E+02	4.74972E+01	-2.18394E+00	2.81199E-01	270.000	.536	.161	.009
340	-7.21734E-02	6.33755E-02	2.32305E-03	6.80531E-02	13.000	-0.007	.036	.007
341	-6.69699E-02	7.49208E-02	2.41928E-03	-4.59147E-02	13.000	-0.007	.037	-.005
342	-1.61072E+02	3.51114E+02	1.56111E+01	2.07257E+00	540.000	-.682	.F53	.034
343	-1.43622E-02	1.38842E-02	2.86970E-03	7.17424E-02	10.000	-0.004	.039	.007
344	-7.19571E-02	1.41378E-02	2.67350E-03	-3.38436E-02	10.000	-0.007	.039	.003
345	-1.94119E+02	7.79508E+02	1.65146E+01	2.42277E+00	540.000	-.713	.703	.003
346	-1.39811E-02	1.29630E-02	2.44746E-03	5.91727E-02	10.000	-0.004	.039	.006
347	-1.42211E-02	9.92910E-02	3.13946E-03	-1.77511E-02	10.000	-0.008	.010	-.007
348	-3.17012E+02	1.83166E+02	1.68172E+01	2.43726E+00	540.000	-.735	.711	.009
349	-9.21191E-02	9.43259E-02	3.18020E-03	4.74324E-02	10.000	-0.004	.039	.006
350	-1.32456E-02	9.26712E-02	2.99821E-03	-4.11195E-03	10.000	-0.004	.039	-.000
351	-3.92115E+02	1.85114E+02	1.69566E+01	2.52713E+00	540.000	-.723	.721	.041
352	-1.73327E-02	1.11145E-02	2.99191E-03	3.60476E-02	10.000	-0.004	.039	.004
353	-9.06952E-02	9.99210E-02	3.25060E-03	6.86817E-03	10.000	-0.004	.039	.004
354	-3.95819E+02	3.16571E+02	1.69035E+01	2.46415E+00	540.000	-.733	.716	.004
355	-9.23942E-02	9.69419E-02	3.27196E-03	2.57661E-02	10.000	-0.004	.039	.003
356	-1.55434E-02	9.05529E-02	3.00301E-03	1.61563E-02	10.000	-0.003	.039	.002
357	-3.86913E-02	3.11147E+02	1.67537E+01	2.52517E+00	540.000	-.717	.719	.041
358	-1.51417E-02	8.16593E-02	2.96406E-03	1.72774E-02	10.000	-0.004	.039	.002
359	-8.96279E-02	9.66004E-02	3.17596E-03	2.52586E-02	10.000	-0.004	.039	.003
360	-3.11203E+02	3.11744E+02	1.66345E+01	2.43774E+00	540.000	-.719	.707	.041
361	-1.70012E-02	9.11147E-02	3.08360E-03	8.62572E-03	10.000	-0.004	.039	.001
362	-7.99476E-02	1.54445E-02	2.82761E-03	3.27583E-02	10.000	-0.004	.039	.003
363	-3.76175E+02	3.76760E+02	1.62669E+01	2.42499E+00	540.000	-.697	.694	.039
364	-7.41821E-02	7.72597E-02	2.58250E-03	1.09505E-03	10.000	-0.007	.039	.000
365	-7.75713E-02	8.69527E-02	2.80591E-03	3.71470E-02	10.000	-0.003	.039	-.004
366	-3.70109E+02	3.54436E+02	1.56534E+01	2.11911E+00	540.000	-.685	.656	.034
367	-6.92790E-02	6.69170E-02	2.32365E-03	-7.58807E-03	10.000	-0.007	.037	-.001
368	-6.62761E-02	6.75773E-02	2.28280E-03	3.22704E-02	10.000	-0.007	.037	-.003
369	-1.69451E+02	1.63144E+02	7.11513E+00	4.25115E-01	270.000	-.628	.614	.014
370	-1.17302E-05	-5.46700E-01	-1.51156E-02	3.21687E-02	694.363	-0.000	-.001	.000
371	-5.21124E-01	1.49544E+01	4.30106E-01	1.17672E-01	694.363	-0.001	.022	.001
372	1.49560E+01	9.18695E-01	-3.89921E-01	1.87566E-01	694.363	.022	.001	.002
373	9.20400E-01	1.27511E+01	3.28629E-01	2.32367E-01	694.363	.001	.011	.003
374	1.77514E+01	-9.69233E-01	-7.11111E-01	2.51741E-01	694.363	.011	-.001	.003
375	-9.66644E-01	1.20510E+01	3.61604E-01	2.48224E-01	694.363	-0.001	.017	.003
376	1.20513E+01	-2.49779E-01	-3.41754E-01	2.23163E-01	694.363	.017	-.000	.003
377	-2.41044E-01	1.37627E+01	3.89189E-01	1.77073E-01	694.363	-0.000	.020	-.002
378	1.37647E+01	-4.89153E-01	-1.95962E-01	1.06106E-01	694.363	.020	-.001	.001
379	-4.14694E-01	-7.91611E-02	1.23757E-02	2.49335E-02	694.363	-0.001	-.000	.000
380	1.11629E+02	9.69048E+01	-1.87141E+00	1.07809E-01	270.000	.680	.359	.011
381	-1.11632E-01	1.37250E-01	4.38041E-03	-7.51675E-03	10.000	-0.012	.014	-.001
382	-1.34442E-01	1.19311E-01	4.13556E-03	2.42360E-02	10.000	-0.013	.012	.002
383	-4.10719E+02	4.41074E+02	1.85442E+01	1.77442E+00	540.000	-.760	.830	.024
384	-1.45771E-01	1.62125E-01	5.25544E-03	-6.57020E-03	10.000	-0.015	.016	-.001
385	-1.52391E-01	1.47267E-01	5.11066E-03	3.95263E-02	10.000	-0.015	.015	.004

386	-4.44645E+02	4.61758E+02	1.95423F+01	2.09550E+00	540.000	-0.823	0.55	0.34
387	-1.56264E-01	1.64494E-01	5.53671E-03	1.04202E-02	10.000	-0.016	0.17	0.01
388	-1.65253F-01	1.66296E-01	5.65430E-03	2.59006E-02	10.000	-0.017	0.17	0.01
389	-4.62616E+02	4.69479F+02	2.01374E+01	2.10447E+00	540.000	-0.857	0.69	0.34
390	-1.68672E-01	1.77297E-01	5.90007E-03	1.60992E-02	10.000	-0.017	0.17	0.01
391	-1.68422E-01	1.71672E-01	5.79994E-03	2.14379E-02	10.000	-0.017	0.17	0.01
392	-4.69071E+02	4.71710E+02	2.03036E+01	2.18564E+00	540.000	-0.867	0.74	0.35
393	-1.70940E-01	1.76382E-01	5.92336E-03	3.09914E-02	10.000	-0.017	0.17	0.01
394	-1.74754E-01	1.79911E-01	6.04423E-03	7.04269E-03	10.000	-0.017	0.17	0.01
395	-4.73714E+02	4.74196E+02	2.04791E+01	2.12927E+00	540.000	-0.877	0.74	0.35
396	-1.75877E-01	1.80339E-01	6.07504E-03	3.26568E-02	10.000	-0.018	0.18	0.01
397	-1.72240F-01	1.77811E-01	5.97010E-03	3.91105E-03	10.000	-0.017	0.17	0.01
398	-4.73463E+02	4.73218E+02	2.04526E+01	2.18319E+00	540.000	-0.877	0.74	0.35
399	-1.71890E-01	1.74015E-01	5.9950E-03	4.61399E-02	10.000	-0.017	0.17	0.01
400	-1.72394E-01	1.80461E-01	6.01703E-03	-9.76011E-03	10.000	-0.017	0.17	0.01
401	-4.75740E+02	4.72799E+02	2.04904F+01	2.10154E+00	540.000	-0.877	0.74	0.35
402	-1.71294E-01	1.70759E-01	5.83319E-03	5.05531E-02	10.000	-0.017	0.17	0.01
403	-1.62541E-01	1.73620E-01	5.73219E-03	-1.51970E-02	10.000	-0.016	0.17	0.01
404	-4.74113E+02	4.68513E+02	2.03649F+01	2.08273E+00	540.000	-0.874	0.74	0.35
405	-1.63543F-01	1.55470E-01	5.44407E-03	6.95546E-02	10.000	-0.016	0.17	0.01
406	-1.56244E-01	1.72464E-01	5.61236E-03	-3.64099E-02	10.000	-0.016	0.17	0.01
407	-4.76725F+02	4.65611E+02	2.03544F+01	1.40967E+00	540.000	-0.883	0.74	0.35
408	-1.66173F-01	1.51626E-01	5.42036E-03	5.97057F-02	10.000	-0.017	0.17	0.01
409	-1.52297F-01	1.66997E-01	5.44414F-03	-3.94811E-02	10.000	-0.015	0.17	0.01
410	-2.37771F+02	2.30660E+02	1.01109F+01	3.10844E-01	270.000	-0.879	0.74	0.35
411	-6.46246F-02	5.29497E+00	1.49100F-01	4.64040F-02	10.000	-0.004	0.17	0.01
412	5.24647F+00	7.00674E+00	4.78427E-02	1.49447E-01	694.363	-0.004	0.17	0.01
413	7.00217E+00	5.67721F+00	-3.64035F-02	2.46907E-01	694.363	0.004	0.17	0.01
414	5.67245F+00	6.3860E+00	1.94374E-02	1.73435F-01	694.363	0.004	0.17	0.01
415	6.74174F+00	4.79046E+00	-4.41924E-02	3.74354E-01	694.363	0.004	0.17	0.01
416	4.74446F+00	5.78104E+00	2.76724F-02	3.82444E-02	694.363	0.004	0.17	0.01
417	5.77616F+00	4.49793F+00	-3.55063E-02	4.74140E-02	694.363	0.004	0.17	0.01
418	4.49340E+00	4.92540E+00	1.70000E-02	4.00433E-02	694.363	0.004	0.17	0.01
419	4.92144F+00	4.34959E-01	-1.10634F-01	2.70317E-02	694.363	0.004	0.17	0.01
420	9.32346F-01	-6.40246E-02	-2.77882E-02	-4.73507F-05	694.363	0.001	0.17	0.01
421	4.49471F+01	1.03617E+02	7.16047E-01	2.19545E-01	270.000	-0.800	0.74	0.35
422	-6.42626E-02	9.50914E-02	2.74475F-03	-1.00392E-01	10.000	-0.007	0.17	0.01
423	-9.34450E-02	6.95552E-02	2.74416F-03	1.19653E-01	10.000	-0.007	0.17	0.01
424	-2.92074E+02	3.52210E+02	1.39185F+01	1.43647E+00	540.000	-0.851	0.74	0.35
425	-6.70773E-02	8.90072E-02	2.66014F-03	-9.54430E-02	10.000	-0.009	0.17	0.01
426	-1.60541E-02	7.09395E-02	2.67825F-03	1.23159E-01	10.000	-0.009	0.17	0.01
427	-3.13430E+02	3.54553E+02	1.44314E+01	2.14433E+00	540.000	-0.840	0.74	0.35
428	-7.05774E-02	8.66446E-02	2.68054E-03	-6.13805E-02	10.000	-0.007	0.17	0.01
429	-4.72342E-02	7.54457E-02	2.71358E-03	9.42391E-02	10.000	-0.008	0.17	0.01
430	-3.35874E+02	7.61421E+02	1.50644E+01	2.17071E+00	540.000	-0.822	0.74	0.35
431	-7.46645E-02	4.59542F-02	2.73466E-03	-3.75527E-02	10.000	-0.007	0.17	0.01
432	-8.19044E-02	7.97062E-02	2.75662E-03	7.56040E-02	10.000	-0.009	0.17	0.01
433	-3.51242E+02	3.65623E+02	1.54444E+01	2.74727E+00	540.000	-0.851	0.74	0.35
434	-7.75647E-02	4.51273E-02	2.77429F-03	-6.44466E-03	10.000	-0.009	0.17	0.01
435	-4.13374E-02	4.25443E-02	2.79577F-03	4.50385E-02	10.000	-0.004	0.17	0.01
436	-3.63012E+02	3.69592E+02	1.58276F+01	2.20413E+00	540.000	-0.872	0.74	0.35
437	-7.94466E-02	4.42201F-02	7.79454E-03	1.19455E-02	10.000	-0.009	0.17	0.01
438	-4.00033E-02	8.40574E-02	2.79784E-03	2.52190E-02	10.000	-0.008	0.17	0.01
439	-3.70741E+02	3.70644E+02	1.60173F+01	2.24649E+00	540.000	-0.886	0.74	0.35
440	-4.11814F-02	4.21094E-02	2.74435E-03	4.20430E-02	10.000	-0.009	0.17	0.01
441	-7.43320E-02	4.51447E-02	1.62188E+01	-5.20017E-03	10.000	-0.008	0.17	0.01
442	-3.74176E+02	3.72537E+02	2.77427E-03	2.17046E+00	540.000	-0.700	0.74	0.35
443	-4.11664E-02	7.94440E-02	2.76536E-03	6.23744E-02	10.000	-0.004	0.17	0.01
444	-7.60624E-02	4.61169E-02	1.64275E+01	-2.65173E-02	10.000	-0.004	0.17	0.01
445	-1.16414E+02	7.73962E+02	7.77511E-02	2.12743E+00	540.000	-0.716	0.74	0.35
446	-8.64824E-02	7.77511E-02	7.77511E-02	9.32545E-02	10.000	-0.009	0.17	0.01
447	-7.64044E-02	4.44424E-02	2.71736E-03	-5.91122E-02	10.000	-0.009	0.17	0.01
448	-3.77597E+02	3.79814F+02	1.67954F+01	1.46455E+00	540.000	-0.776	0.74	0.35
449	-4.12346F-02	4.05903E-02	2.46497E-03	4.19999E-02	10.000	-0.009	0.17	0.01

450	-7.97739F-02	9.27944E-02	2.94226E-03	-5.96272E-02	10.000	-0.008	.079	-0.006
451	-2.02197E+02	1.93097E+02	8.55471E+00	4.16140F-01	270.000	-0.751	.715	.014
452	-4.77440F-02	2.54460E-01	8.40567E-03	1.22457E-03	694.363	-0.009	.000	.000
453	2.43942E-01	2.34544E+00	5.43750E-02	2.11343E-02	694.363	.000	.003	.003
454	2.74501E+00	3.79134E+00	4.01761E-02	6.11059E-02	694.363	.003	.005	.005
455	3.79206F+00	3.84413E+00	1.44632F-03	9.47343E-02	694.363	.005	.006	.006
456	3.94601F+00	4.07924E+00	6.47457E-03	9.42696E-02	694.363	.006	.006	.006
457	4.09219E+00	3.51956E+00	-1.56560F-02	8.93105E-02	694.363	.006	.006	.006
458	3.52244F+00	3.06407E+00	-1.27334F-02	7.02729E-02	694.363	.006	.006	.006
459	3.06916E+00	1.32977E+01	-4.43164F-02	4.00069E-02	694.363	.006	.006	.006
460	1.34415E+00	-2.34135E-02	-3.79379E-02	1.23294E-02	694.363	.002	.002	.002
461	-3.27541E-04	-2.64077E-02	-7.35559E-04	-2.04612E-04	694.363	-0.009	-0.009	-0.009
462	-3.95310E+01	1.58697E+01	2.70910F+00	5.94329E-01	270.000	-0.146	.014	.014
463	-2.21096E-02	3.79755E-02	1.30422F-03	-1.71591E-01	10.000	-0.002	.004	.012
464	-4.37312E-02	2.71311E-02	1.20920F-03	1.49553E-01	10.000	-0.004	.013	.013
465	-1.11227E+02	1.54992E+02	5.93594E+00	2.14279E+00	540.000	-0.205	.294	.033
466	-1.64229E-02	1.12449E-02	1.12449E-04	-1.71793E-01	10.000	-0.002	.003	.012
467	-3.55406E-02	2.10296E-02	9.65169E-04	1.62162E-01	10.000	-0.004	.002	.010
468	-8.93757F+01	1.77499E+02	4.90154E+00	2.44019E+00	540.000	-0.166	.255	.040
469	-1.56273E-02	2.87562E-02	7.49837E-04	-1.50271E-02	10.000	-0.002	.003	.009
470	-2.94564E-02	2.05629E-02	1.60127E-04	1.25963E-01	10.000	-0.003	.002	.013
471	-1.31748E+02	1.39350E+02	5.20485E+00	2.44415E+00	540.000	-0.189	.258	.040
472	-1.71401E-02	2.66751E-02	7.47050E-04	-4.93631E-02	10.000	-0.002	.003	.013
473	-2.65216E-02	2.21577E-02	9.70352E-04	2.55721E+00	540.000	-0.003	.002	.013
474	-1.25242F+02	1.44925E+02	5.92332F+00	-6.66724E-03	10.000	-0.002	.002	.013
475	-1.95449E-02	2.54816E-02	7.74629E-04	4.06595E-02	10.000	-0.002	.002	.013
476	-2.34976E-02	2.33249E-02	8.09291F-04	2.53059E+00	540.000	-0.002	.002	.013
477	-1.46237E+02	1.57947E+02	6.57181E+00	2.55294F-02	10.000	-0.002	.002	.013
478	-2.16021E-02	2.46865E-02	7.99411E-04	1.64675E-02	10.000	-0.002	.002	.013
479	-2.14456F-02	2.44543E-02	7.91293F-04	2.55930E+00	540.000	-0.002	.002	.013
480	-1.65360F+02	1.66219F+02	7.16369E+00	6.50937E-02	10.000	-0.002	.002	.013
481	-2.40729E-02	2.36420F-02	8.13137E-04	-2.30997E-02	10.000	-0.002	.002	.013
482	-1.99976F-02	2.50012E-02	7.67291F-04	2.49023F+00	540.000	-0.002	.002	.013
483	-1.93767E+02	1.74574E+02	7.73521E-04	9.49037E-02	10.000	-0.002	.002	.013
484	-2.69791E-02	2.26065E-02	8.45826F-04	-5.32614E-02	10.000	-0.002	.002	.013
485	-1.72514E-02	2.62172F-02	7.75790F-04	2.53039E+00	540.000	-0.002	.002	.013
486	-2.73812E+02	1.86249E+02	4.42449E+00	-8.75247E-02	10.000	-0.002	.002	.013
487	-2.70994E-02	3.14446E-02	9.99117F-04	8.75247E-02	10.000	-0.002	.002	.013
488	-2.70994E-02	3.14446E-02	9.99117F-04	8.75247E-02	10.000	-0.002	.002	.013
489	-2.73423E+02	2.00899F+02	9.16714F+00	2.29734E+00	540.000	-0.002	.002	.013
490	-3.50149F-02	2.63205E-02	1.04611F-03	1.12246E-01	10.000	-0.004	.014	.014
491	-2.77159F-02	3.11335E-02	9.18037E-04	-1.15936E-02	10.000	-0.004	.014	.014
492	-1.19694F+02	1.07977E+02	4.91454E+00	7.12049F-01	270.000	-0.443	.400	.014
493	-3.66612E-02	-1.72970E+00	-4.70294E-02	-1.94224E-02	694.363	-0.000	.000	.000
494	-1.74997E+00	-1.47256E-01	4.45194E-02	-1.44663F-02	694.363	-0.003	.003	.003
495	-1.65947E-01	1.37022F+00	4.23934E-02	-7.16071E-03	694.363	-0.000	.000	.000
496	1.36399E+00	2.04903E+00	1.90297E-02	5.70003E-03	694.363	.002	.002	.002
497	2.34559E+00	2.36945E+00	8.99611F-03	1.47243E-02	694.363	.003	.003	.003
498	2.36945E+00	1.97499E+00	-1.09394E-02	1.75970E-02	694.363	.003	.003	.003
499	1.97676F+00	1.20291E+00	-2.14959E-02	1.43999E-02	694.363	.003	.003	.003
500	1.20720E+00	-4.44270E-02	-3.58785E-02	7.20793E-03	694.363	.002	.002	.002
501	-8.07890F-02	-5.50134E-01	-1.30375E-02	5.46892E-02	694.363	-0.003	.003	.003
502	-5.44427E-01	-9.66484E-03	1.44545F-02	-2.11613E-02	694.363	-0.001	.001	.001
503	-6.47013F+01	2.89900E+01	2.02194E+00	9.53374E-01	270.000	-0.240	.137	.014
504	1.24764F-02	-4.04355F-03	-2.80929E-04	1.54332E-01	10.000	-0.001	.000	.012
505	-5.44273E-03	-3.80853E-03	3.47056F+05	2.52025E+00	540.000	-0.001	.000	.012
506	9.67665E+01	-6.83739E+01	-3.56793F+00	-1.30315E-01	10.000	-0.001	.000	.012
507	1.65835F-02	-7.75251E-03	-4.14227E-04	1.73101E-01	10.000	.002	.002	.012
508	-2.56006E-03	-9.21568E-03	-9.64965E-05	2.67961E+00	540.000	-0.000	.000	.012
509	1.27350E+02	-9.49728E+01	-4.92406E-04	-9.55813E-02	10.000	.002	.002	.012
510	1.47218E-02	-1.01625E-02	-1.19538E-02	1.33995E-01	10.000	.000	.000	.014
511	3.19215E-03	-1.05153F+02	-5.17683F+00	2.72361E+00	540.000	.249	.195	.014
512	1.34460E+02	-1.14484F-02	-5.06734E-04	-5.72241E-02	10.000	.002	.002	.014
513	1.92727E-02							

514	7.60742E-07	-1.27400E-32	-3.47023E-04	1.02536E-01	10.000	.001	-.001	.010
515	1.23571E+02	-1.02424E+02	-4.49134E+00	2.79234E+00	540.000	.023	-.190	.040
516	1.61714E-02	-1.17142E-02	-4.75544E-04	-1.05354E-02	10.000	.002	-.001	-.001
517	1.11464E-02	-1.24543E-32	-4.09676E-04	5.62941E-02	11.000	.001	-.001	.000
518	1.06441E+00	-9.57549E+01	-4.37162E+00	2.77474E+00	540.000	.194	-.177	.040
519	1.37510E-02	-1.20470E-02	-4.39940E-04	2.11033E-02	10.000	.001	-.001	.000
520	1.36340E-02	-1.25342E-32	-4.46297E-04	1.77136E-02	10.000	.001	-.001	.000
521	4.72454E+01	-1.60412E+01	-3.74477E+00	2.79903E+00	540.000	.102	-.159	.040
522	1.05646E-02	-1.14013E-02	-3.31555E-04	7.15327E-02	10.000	.001	-.001	.000
523	1.54444E-02	-1.24146E-02	-4.75713E-04	-2.60309E-02	10.000	.002	-.001	.000
524	6.64255E+01	-7.42031E+01	-1.04691E+00	2.74199E+00	540.000	.124	-.137	.040
525	7.14965E-03	-1.09443E-02	-3.07015E-04	1.04014E-01	10.000	.001	-.001	.000
526	1.57744E-02	-1.16455E-02	-4.67500E-04	-5.91269E-02	10.000	.002	-.001	.000
527	4.50545E+01	-5.46550E+01	-2.24055E+00	2.71873E+00	540.000	.083	-.071	.040
528	3.35649E-07	-4.37744E-03	-1.05171E-02	1.33475E-01	10.000	.001	-.001	.000
529	1.49357E-02	-1.05171E-02	-4.33911E-04	-9.01377E-02	10.000	.001	-.001	.000
530	2.53465E+01	-4.11698E+01	-1.43707E+00	2.52230E+00	540.000	.047	-.075	.040
531	4.41224E-04	-6.10916E-03	-1.19240E-04	1.14940E-01	10.000	.001	-.001	.000
532	1.22317E-02	-7.55144E-03	-1.37274E-04	-7.77027E-02	10.000	.001	-.001	.000
533	3.47027E+00	-1.15555E+01	-3.32633E-01	1.00737E+00	270.000	.014	-.001	.000
534	-2.64744E-02	-8.20446E-01	-2.20947E-02	-3.43929E-02	694.363	-.001	-.001	.000
535	-9.47143E-01	-1.26469E+00	-1.15946E-02	-3.41560E-02	694.363	-.001	-.001	.000
536	-1.27779E+00	-1.62467E-01	2.54257E-02	-6.53369E-02	694.363	-.002	-.001	.000
537	-3.72651E-01	4.64461E-01	2.32533E-02	-6.95767E-02	694.363	-.001	-.001	.000
538	4.54307E-01	4.55166E-01	1.10240E-02	-6.74351E-02	694.363	.001	-.001	.000
539	4.53494E-01	6.20944E-01	-6.45446E-03	-6.50151E-02	694.363	.001	-.001	.000
540	6.23344E-01	6.34720E-03	-1.71444E-02	-9.96469E-02	694.363	.001	-.001	.000
541	1.25425E-02	-6.25425E-01	-1.47547E-02	-9.96469E-02	694.363	.001	-.001	.000
542	-6.43523E-01	-5.77444E-01	2.21341E-03	-4.93976E-02	694.363	-.001	-.001	.000
543	-5.77444E-01	-1.91494E+01	1.56904E-03	-3.74939E-02	694.363	-.001	-.001	.000
544	-1.74534E+01	1.47467E+00	1.51027E-02	1.24702E+00	270.000	-.324	-.071	.040
545	4.14234E-02	-1.65726E-02	-1.35577E-03	-9.41928E-02	10.000	.004	-.074	.040
546	2.44674E-02	-3.04419E-02	-9.50427E-04	1.42257E-01	10.000	.002	-.074	.040
547	2.51767E+02	-2.76025E+02	-1.05349E+01	2.79247E+00	540.000	.466	-.074	.040
548	4.47492E-02	-4.01597E-02	-1.44407E-03	-1.16377E-01	10.000	.004	-.074	.040
549	2.40620E-02	-2.44443E+02	-1.00331E-03	1.62824E+00	10.000	.003	-.074	.040
550	2.43105E+02	-4.17744E-02	-1.10512E+01	2.48294E+00	540.000	.447	-.074	.040
551	4.61476E-02	-3.72242E-02	-1.49495E-03	-3.91115E-02	10.000	.005	-.074	.040
552	3.17163E-02	-2.58592E+02	-1.15915E-03	1.36295E-01	10.000	.003	-.074	.040
553	2.72467E+02	-4.26144E-02	-1.14422E+01	-2.90313E+00	540.000	.505	-.074	.040
554	4.65047E-02	-3.53607E-02	-1.51463E-03	-5.49016E-02	10.000	.005	-.074	.040
555	3.53607E-02	-4.01201E-02	-1.28475E-03	1.02574E-01	10.000	.004	-.074	.040
556	2.74473E+02	-2.67670E+02	-1.16051E+01	2.96577E+00	540.000	.004	-.074	.040
557	4.44920E-02	-4.22731E-02	-1.44443E-03	-1.04571E-02	10.000	.004	-.074	.040
558	3.44016E-02	-4.14331E-02	-1.44443E-03	5.44631E-02	10.000	.004	-.074	.040
559	2.69249E+02	-4.23970E-02	-1.14777E+01	2.95120E+00	540.000	.499	-.074	.040
560	4.23970E-02	-4.15490E-02	-1.44332E-03	2.79014E-02	10.000	.004	-.074	.040
561	4.20015E-02	-4.24552E-02	-1.44144E-03	2.02071E-02	10.000	.004	-.074	.040
562	2.50044E+02	-2.54006E+02	-1.11926E+01	2.46760E+00	540.000	.482	-.074	.040
563	3.14267E-02	-1.99217E-02	-1.74317E-03	6.97002E-02	10.000	.004	-.074	.040
564	4.14047E-02	-4.24574E-02	-1.47780E-03	-2.17052E-02	10.000	.004	-.074	.040
565	2.49331E+02	-2.51642E+02	-1.04236E+01	2.93025E+00	540.000	.462	-.074	.040
566	1.51879E-02	-3.76176E-02	-1.24197E-03	1.00237E-01	10.000	.004	-.074	.040
567	4.14951E-02	-4.24512E-02	-1.47214E-03	-5.25007E-02	10.000	.004	-.074	.040
568	2.38639E+02	-2.47267E+02	-1.04116E+01	2.92246E+00	540.000	.442	-.074	.040
569	1.16447E-02	-3.43025E-02	-1.12574E-03	1.24796E-01	10.000	.003	-.074	.040
570	4.34727E-02	-4.16529E-02	-1.44443E-03	-7.40339E-02	10.000	.004	-.074	.040
571	2.95700E+02	-2.33465E+02	-1.00125E+01	2.79415E+00	540.000	.425	-.074	.040
572	3.05245E-02	-3.25177E-02	-1.07540E-03	-6.19140E-02	10.000	.003	-.074	.040
573	4.01014E-02	-3.46777E-02	-1.34441E-03	1.26333E+00	10.000	.004	-.074	.040
574	1.10355E+02	-1.11909E+02	-4.40196E+00	-4.39235E-02	694.363	-.001	-.074	.040
575	-1.56264E-02	-5.04242E-01	-1.35726E-02	-7.47125E-02	694.363	-.001	-.074	.040
576	-5.34714E-01	-1.40517E+00	-2.41904E-02	-1.00190E-01	694.363	-.002	-.074	.040
577	-1.42124E+00	-1.17644E+00	6.74723E-03					

574	-1.18945E+00	-6.20230E-01	1.58116E-02	-1.15645E-01	694.363	-0.002	-0.001	-0.001
579	-6.27841E-01	-2.54050E-01	1.02731E-02	-1.21643E-01	694.363	-0.001	-0.000	-0.002
580	-2.60244E-01	-3.34426E-01	-2.06049E-03	-1.19570E-01	694.363	-0.000	-0.000	-0.002
581	-3.11223E-01	-5.41431E-01	-6.95021E-03	-1.10317E-01	694.363	-0.003	-0.001	-0.001
582	-5.73430E-01	-7.37092E-01	-4.54617E-03	-9.39164E-02	694.363	-0.001	-0.001	-0.001
583	-7.25504E-01	-4.06742E-01	4.45444E-03	-7.02057E-02	694.363	-0.001	-0.001	-0.001
584	-3.94899E-01	1.41401E-02	1.13633E-02	-4.18013E-02	694.363	-0.001	-0.001	-0.001
585	-1.11344E+02	-5.11033E+01	1.30160E+00	1.55177E+00	270.000	-0.412	-0.149	-0.000
586	6.16750E-02	-5.97476E-02	-2.07041E-03	-7.05379E-02	10.000	0.006	-0.006	-0.000
587	4.73975E-02	-5.00738E-02	-1.66272E-03	1.20502E-01	10.000	0.005	-0.005	-0.000
588	3.26446E+02	-7.23015E+02	-1.40318E+01	-2.98492E+02	540.000	0.605	-0.598	-0.001
589	6.51400E-02	-6.43730E-02	-2.20792E-03	-9.03004E-02	10.000	0.007	-0.006	-0.001
590	4.90052E-02	-5.20329E-02	-1.72374E-03	1.39451E-01	10.000	0.005	-0.005	-0.000
591	3.73394E+02	-7.30992E+02	-1.43547E+01	3.03341E+00	540.000	0.617	-0.613	-0.001
592	6.60796E-02	-6.54541E-02	-2.24250E-03	-7.16063E-02	10.000	0.007	-0.007	-0.000
593	5.25163E-02	-5.54676E-02	-1.44495E-03	1.20502E-01	10.000	0.005	-0.005	-0.000
594	3.41144E+02	-7.38091E+02	-1.46759E+01	3.02702E+00	540.000	0.632	-0.626	-0.001
595	6.67747E-02	-6.57464E-02	-2.25959E-03	-4.55141E-02	10.000	0.007	-0.007	-0.000
596	5.63765E-02	-5.95673E-02	-1.72755E-03	9.47530E-02	10.000	0.006	-0.006	-0.000
597	3.46747E+02	-7.42741E+02	-1.48975E+01	3.05545E+00	540.000	0.642	-0.635	-0.001
598	6.58642E-02	-6.49022E-02	-2.22986E-03	-3.24257E-02	10.000	0.007	-0.005	-0.001
599	6.12257E-02	-6.26374E-02	-2.09953E-03	5.46194E-02	10.000	0.006	-0.006	-0.000
600	3.48992E+02	-7.44342E+02	-1.49611E+01	3.35363E+00	540.000	0.645	-0.638	-0.001
601	6.74477E-02	-6.75341E-02	-2.17234E-03	2.41983E-02	10.000	0.006	-0.006	-0.000
602	6.74724E-02	-6.43544E-02	-2.16481E-03	2.53047E-02	10.000	0.006	-0.006	-0.000
603	3.45845E+02	-7.43450E+02	-1.44926E+01	3.07021E+00	540.000	0.640	-0.636	-0.001
604	6.76645E-02	-6.10530E-02	-2.07902E-03	5.98150E-02	10.000	0.006	-0.006	-0.000
605	6.45911E-02	-5.55126E-02	-2.71454E-03	-1.02111E-02	10.000	0.000	-0.000	-0.000
606	3.42064E+02	-7.40633E+02	-1.47699E+01	3.05425E+00	540.000	0.633	-0.627	-0.001
607	5.76925E-02	-5.42200E-02	-1.97546E-03	9.52111E-02	10.000	0.006	-0.006	-0.000
608	6.44739E-02	-6.56239E-02	-2.72349E-03	-3.54917E-02	10.000	0.006	-0.006	-0.000
609	3.38040E+02	-7.36644E+02	-1.45771E+01	3.06414E+00	540.000	0.620	-0.613	-0.001
610	5.40160E-02	-5.50156E-02	-1.47577E-03	-1.04079E-01	10.000	0.003	-0.003	-0.000
611	6.47433E-02	-6.92472E-02	-1.47526E-03	-7.00944E-03	10.000	0.005	-0.005	-0.000
612	3.74455E+02	-7.73301E+02	-1.44141E+01	2.71557E+00	540.000	0.620	-0.613	-0.001
613	5.47971E-02	-5.41500E-02	-1.84947E-03	-3.73046E-02	10.000	0.006	-0.006	-0.000
614	6.16516E-02	-6.25623E-02	-2.11791E-03	4.57900E-02	10.000	0.006	-0.006	-0.000
615	1.65731E+02	-1.63010E+02	-7.12195E+00	-3.73046E-02	10.000	0.006	-0.006	-0.000
616	5.44267E-04	-9.77017E-01	-2.71545E-02	1.45944E+00	270.000	0.614	-0.607	-0.001
617	-1.10332E+00	-1.27250E+00	-7.15455E-02	-4.97306E-02	694.363	-0.000	-0.001	-0.001
618	-1.24911E+00	-1.19452E+00	-7.47724E-03	-4.44453E-02	694.363	-0.001	-0.001	-0.001
619	-1.21154E+00	-1.09716E+00	2.51624E-03	-1.16336E-01	694.363	-0.002	-0.002	-0.001
620	-1.01506E+00	-4.06106E-01	5.67443E-03	-1.77178E-01	694.363	-0.002	-0.001	-0.001
621	-4.08149E-01	-7.86672E-01	5.40434E-03	-1.46438E-01	694.363	-0.001	-0.001	-0.001
622	-7.32461E-01	-5.96595E-04	5.96595E-04	-1.44424E-01	694.363	-0.001	-0.001	-0.001
623	-7.42031E-01	-7.51001E-01	4.44346E-04	-1.31641E-01	694.363	-0.001	-0.001	-0.001
624	-5.79207E-01	-5.91907E-01	4.17010E-03	-1.09207E-01	694.363	-0.001	-0.001	-0.001
625	-1.44926E-01	-1.61510E-01	1.16025E-02	-7.39081E-02	694.363	-0.001	-0.001	-0.001
626	-1.16445E+02	2.51021E-02	4.43411E-03	-4.62257E-02	694.363	-0.000	-0.000	-0.000
627	6.69144E-02	-7.29443E+01	9.40646E-01	1.72173E+00	270.000	-0.431	-0.773	-0.000
628	5.30475E-02	-6.95592E-02	-2.32703E-03	-3.93609E-02	10.000	0.007	-0.007	-0.000
629	3.50009E+02	-5.67005E-02	-1.95796E-03	9.32512E-02	10.000	0.006	-0.006	-0.000
630	7.10961E-02	-3.58490E+02	-1.53161E+01	3.32544E+00	540.000	0.648	-0.645	-0.001
631	5.76292E-02	-7.39509E-02	-2.47299E-03	-5.94313E-02	10.000	0.007	-0.007	-0.000
632	3.59737E+02	-3.65766E-02	-2.02976E-03	1.10339E-01	10.000	0.006	-0.006	-0.000
633	7.23744E-02	-7.45019E-02	-1.56744E+01	3.11242E+00	540.000	0.666	-0.666	-0.001
634	6.14572E-02	-6.22094E-02	-2.50432E-03	-4.95431E-02	10.000	0.007	-0.007	-0.000
635	1.57131E+02	-3.70721E+02	-2.11635E-03	9.94340E-02	10.000	0.006	-0.006	-0.000
636	7.31094E-02	-3.70721E+02	-1.59416E+01	3.04570E+00	540.000	0.640	-0.637	-0.001
637	6.43941E-02	-7.43024E-02	-2.51354E-03	-3.25374E-02	10.000	0.007	-0.007	-0.000
638	3.73557E+02	-6.54705E-02	-2.21512E-03	8.25104E-02	10.000	0.006	-0.006	-0.000
639	7.26067E-02	-7.11744E-02	-1.61541E+01	3.09507E+00	540.000	0.691	-0.677	-0.001
640	6.73697E-02	-6.84814E-02	-2.44496E-03	-6.41840E-03	10.000	0.007	-0.007	-0.000
641	7.73444E+02	-3.76714E+02	-1.62917E+01	5.61594E-02	10.000	0.007	-0.007	-0.000
				3.09244E+00	540.000	0.649	-0.648	-0.001

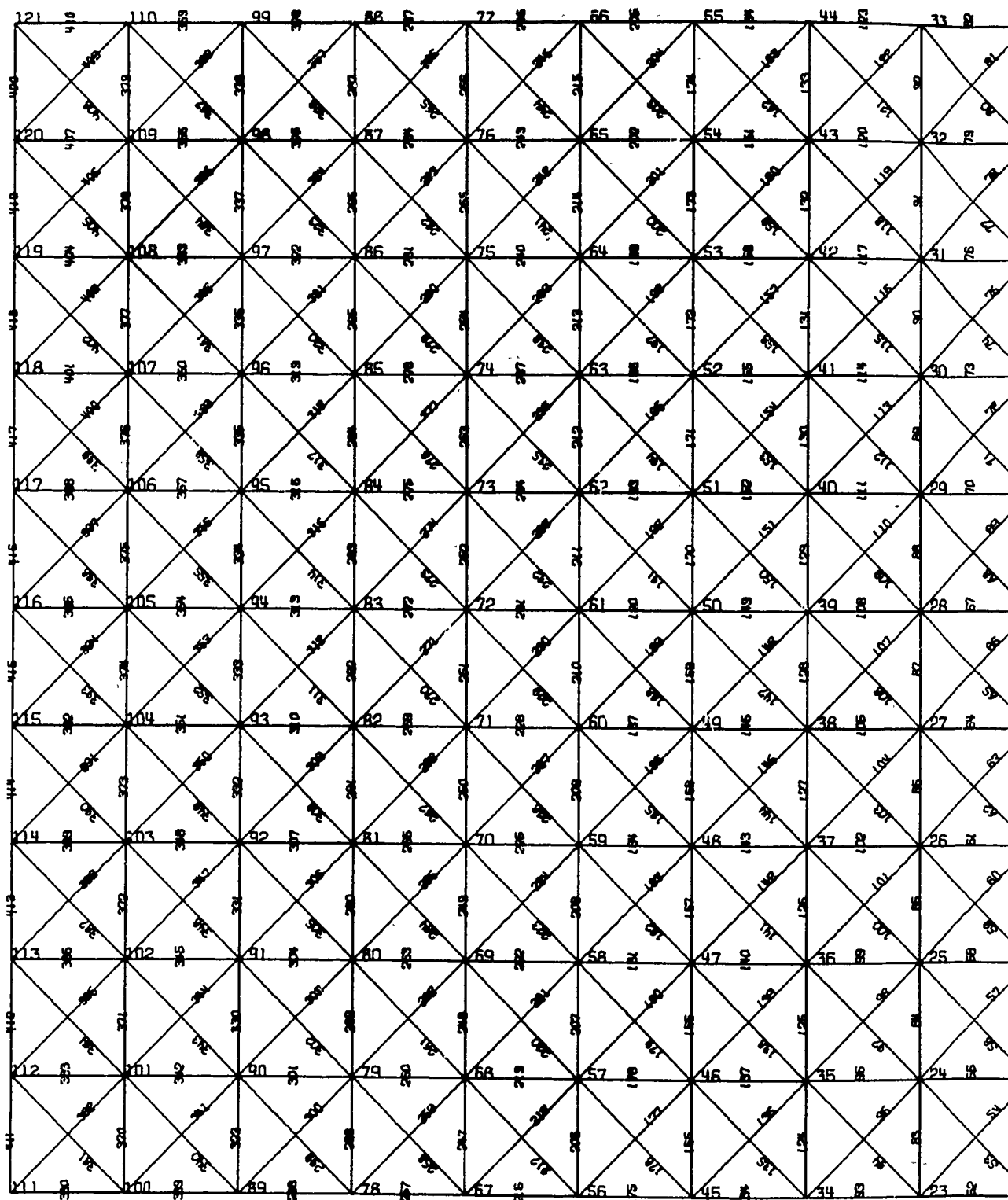
642	7.13697E-02	-7.15256E-02	-7.43690E-03	1.94672E-02	10.000	.007	-0.007	.007
643	6.06144E-02	-7.13051E-02	-7.40730E-03	3.16104E-02	10.000	.007	-0.007	.007
644	3.74904E+02	-7.77191E+02	-1.67356E+01	3.11023E+00	540.000	.702	-0.699	.003
645	6.91942E-02	-6.90473E-02	-2.35775E-03	4.51857E-02	10.000	.007	-0.007	.007
646	7.17202E-02	-7.31923E-02	-2.46410E-03	3.15254E-03	10.000	.007	-0.007	.007
647	7.79024E+02	-3.76278E+02	-1.67186E+01	3.11219E+00	540.000	.702	-0.699	.003
648	6.72747E-02	-6.65976E-02	-2.24241E-03	6.34974E-02	10.000	.007	-0.007	.007
649	7.19446E-02	-7.79553E-02	-2.44793E-03	-1.31475E-02	10.000	.007	-0.007	.007
650	3.78367E+02	-3.74610E+02	-1.62684E+01	3.13692E+00	540.000	.701	-0.694	.006
651	6.56527E-02	-6.42015E-02	-2.21491E-03	7.72861E-02	10.000	.007	-0.007	.007
652	7.21044E-02	-7.41748E-02	-2.44925E-03	-2.62891E-02	10.000	.007	-0.007	.007
653	3.77770E+02	-3.72893E+02	-1.62184E+01	3.11413E+00	540.000	.700	-0.691	.009
654	6.65791E-02	-6.45449E-02	-2.23647E-03	6.15337E-02	10.000	.007	-0.007	.007
655	7.11346E-02	-7.21909E-02	-2.42702E-03	-1.73520E-02	10.000	.007	-0.007	.007
656	1.94430E+02	-1.95733E+02	-1.04385E+00	1.54465E+00	270.000	.694	-0.694	.000
657	7.53273E-02	-1.24459E+00	-3.52754E-02	3.09407E-02	694.363	.000	-0.007	.000
658	-1.25753E+00	-9.55913E-01	4.37427E-03	-8.24849E-02	694.363	.002	-0.001	.001
659	-9.70659E-01	-4.43714E-01	3.52624E-03	-1.12097E-01	694.363	.001	-0.001	.001
660	-4.55759E-01	-4.64889E-01	-3.59184E-04	-1.32930E-01	694.363	.001	-0.001	.001
661	-4.76115E-01	-4.18942E-01	1.54113E-03	-1.43146E-01	694.363	.001	-0.001	.001
662	-4.20945E-01	-7.93960E-01	7.49542E-04	-1.41797E-01	694.363	.001	-0.001	.001
663	-7.70510E-01	-6.56462E-01	3.71243E-03	-1.21091E-01	694.363	.001	-0.001	.001
664	-6.44646E-01	-3.94265E-01	6.95500E-03	-1.06391E-01	694.363	.001	-0.001	.001
665	-3.46674E-01	4.95419E-02	1.21171E-02	-7.64266E-02	694.363	.001	-0.001	.001
666	6.07444E-02	7.00542E-02	-4.52309E-04	-4.61367E-02	694.363	.001	-0.001	.001
667	-4.20444E-01	-4.74372E-01	1.00404E-01	1.79135E+00	270.000	.341	-0.341	.000
668	5.64506E-02	-6.24670E-02	-2.07462E-03	-1.09615E-02	10.000	.006	-0.006	.006
669	5.79166E-02	-4.95144E-02	-1.76415E-03	6.67203E-02	10.000	.005	-0.005	.005
670	3.79301E+02	-3.57744E+02	-1.50514E+01	3.21563E+00	540.000	.694	-0.696	.002
671	6.11422E-02	-5.44323E-02	-2.13095E-03	-3.09630E-02	10.000	.006	-0.006	.006
672	5.32679E-02	-5.32679E-02	-1.77416E-03	8.26396E-02	10.000	.005	-0.005	.005
673	3.60746E+02	-3.67459E+02	-1.64401E+01	3.11379E+00	540.000	.694	-0.694	.000
674	6.15575E-02	-6.44505E-02	-2.15541E-03	-2.45065E-02	10.000	.005	-0.005	.005
675	5.39496E-02	-5.24160E-02	-1.81496E-03	7.47919E-02	10.000	.005	-0.005	.005
676	3.68171E+02	-3.66064E+02	-1.56474E+01	3.07751E+00	540.000	.694	-0.694	.000
677	6.79794E-02	-6.47473E-02	-2.15644E-03	-1.43505E-02	10.000	.005	-0.005	.005
678	5.57166E-02	-5.46114E-02	-1.47324E-03	6.91494E-02	10.000	.006	-0.006	.006
679	3.64272E+02	-3.69179E+02	-1.58465E+01	3.07235E+00	540.000	.694	-0.694	.000
680	6.17001E-02	-6.31145E-02	-2.12849E-03	-3.12614E-03	10.000	.005	-0.005	.005
681	5.70297E-02	-5.77536E-02	-1.95946E-03	5.24021E-02	10.000	.006	-0.006	.006
682	3.69499E+02	-3.71527E+02	-1.60099E+01	3.06849E+00	540.000	.694	-0.694	.000
683	6.10776E-02	-6.16829E-02	-2.09350E-03	1.25679E-02	10.000	.006	-0.006	.006
684	5.95454E-02	-5.96366E-02	-2.01557E-03	3.77240E-02	10.000	.006	-0.006	.006
685	3.73296E+02	-3.72466E+02	-1.61211E+01	3.09775E+00	540.000	.694	-0.694	.000
686	5.99494E-02	-5.97359E-02	-2.04115E-03	2.94242E-02	10.000	.006	-0.006	.006
687	5.39648E-02	-6.16910E-02	-2.07469E-03	2.33726E-02	10.000	.006	-0.006	.006
688	3.75940E+02	-3.73261E+02	-1.61477E+01	3.10221E+00	540.000	.694	-0.694	.000
689	5.91156E-02	-5.80944E-02	-1.99903E-03	4.17161E-02	10.000	.006	-0.006	.006
690	6.77464E-02	-6.79730E-02	-2.10179E-03	3.01422E-03	10.000	.005	-0.005	.005
691	3.77512E+02	-3.73010E+02	-1.62169E+01	3.13772E+00	540.000	.694	-0.694	.000
692	5.95177E-02	-5.66929E-02	-1.96494E-03	5.04044E-02	10.000	.006	-0.006	.006
693	6.14444E-02	-6.35646E-02	-2.17250E-03	8.74173E-04	10.000	.006	-0.006	.006
694	3.74364E+02	-3.72864E+02	-1.62307E+01	3.14235E+00	540.000	.701	-0.690	.011
695	5.99900E-02	-5.79972E-02	-2.09566E-03	3.92210E-02	10.000	.005	-0.005	.005
696	6.77172E-02	-6.23097E-02	-2.09240E-03	1.33551E-02	10.000	.006	-0.006	.006
697	1.99273E+02	-1.96606E+02	-9.11956E+00	1.63492E+00	270.000	.701	-0.691	.010
698	7.95474E-02	-7.67602E-02	-2.22919E-02	-4.54943E-02	694.363	.000	-0.001	.001
699	-7.64467E-01	-5.00668E-01	7.31982E-03	-6.71521E-02	694.363	.001	-0.001	.001
700	-5.12023E-01	-4.56074E-01	1.55252E-03	-8.97415E-02	694.363	.001	-0.001	.001
701	-4.65794E-01	-5.41667E-01	-2.10757E-03	-1.07444E-01	694.363	.001	-0.001	.001
702	-5.48107E-01	-5.52291E-01	-1.15947E-04	-1.17079E-01	694.363	.001	-0.001	.001
703	-5.54599E-01	-5.51294E-01	9.15383E-05	-1.17169E-01	694.363	.001	-0.001	.001
704	-5.49392E-01	-4.32044E-01	7.25927E-03	-1.07595E-01	694.363	.001	-0.001	.001
705	-4.26476E-01	-2.36449E-01	5.27452E-03	-9.95255E-02	694.363	.001	-0.001	.001

706	-2.2A243E-01	1.47516E-01	1.04197E-02	-6.55229E-02	694.363	-0.000	0.000	-0.001
707	1.55355E-01	2.57707E-02	-3.59955E-03	-4.25157E-02	694.363	0.000	0.000	-0.001
708	-4.4A725E+01	-9.99025E+01	-8.46486E-01	1.71605E+00	270.000	-0.141	-0.333	0.001
709	3.7353AE-02	-4.20860E-02	-1.35470E-03	7.29795E-03	10.000	0.004	-0.004	0.001
710	3.69A6AF-02	-3.77725E-02	-1.1A977E-03	4.43144E-02	10.000	0.004	-0.003	0.005
711	2.99900E+02	-3.19325E+02	-1.13787E+01	3.21022E+00	540.000	0.555	-0.591	0.052
712	1.17706E-02	-4.26915E-02	-1.3A914E-03	-1.01670E-02	10.000	0.004	-0.004	-0.001
713	3.432A7E-02	-3.14353E-02	-1.12167E-03	6.13442E-02	10.000	0.003	-0.003	0.000
714	1.06210E+02	-3.21022E+02	-1.35531E+01	3.04257E+00	540.000	0.567	-0.594	0.000
715	3.95663E-02	-4.25546E-02	-1.40034E-03	-1.17173E-02	10.000	0.004	-0.004	-0.001
716	3.41113E-02	-3.20427E-02	-1.12132E-03	6.09492E-02	10.000	0.003	-0.003	0.000
717	3.11996E+02	-3.23461E+02	-1.37292E+01	2.99240E+00	540.000	0.571	-0.579	0.000
718	1.97710E-02	-4.20707E-02	-1.39559E-03	-8.05367E-03	10.000	0.004	-0.004	-0.001
719	3.44075E-02	-3.30822E-02	-1.15110E-03	5.66996E-02	10.000	0.003	-0.003	0.000
720	3.17A11E+02	-3.26227E+02	-1.39146E+01	2.94673E+00	540.000	0.589	-0.584	0.000
721	3.94935E-02	-4.10398E-02	-1.37332E-03	1.47095E-04	10.000	0.004	-0.004	0.000
722	1.51917E-02	-3.47331E-02	-1.19259E-03	4.43289E-02	10.000	0.004	-0.003	0.005
723	3.24223E+02	-3.24925E+02	-1.41114E+01	2.98107E+00	540.000	0.600	-0.599	0.001
724	3.92570E-02	-4.00059E-02	-1.35169E-03	8.06918E-03	10.000	0.004	-0.004	-0.001
725	1.54959E-02	-3.62513E-02	-1.23046E-03	4.05161E-02	10.000	0.004	-0.004	0.000
726	3.29997E+02	-3.31156E+02	-1.42844E+01	3.00100E+00	540.000	0.611	-0.613	0.000
727	3.94425E-02	-3.87459E-02	-1.32317E-03	1.71277E-02	10.000	0.004	-0.004	0.000
728	3.67190E-02	-3.77960E-02	-1.27081E-03	3.18559E-02	10.000	0.004	-0.004	0.000
729	1.35100E+02	-3.27774E+02	-1.44297E+01	3.12237E+00	540.000	0.621	-0.616	0.000
730	3.17066E-02	-3.74559E-02	-1.30570E-03	2.32701E-02	10.000	0.004	-0.004	0.000
731	1.71144E-02	-3.88221E-02	-1.29444E-03	2.63663E-02	10.000	0.004	-0.004	0.000
732	3.3A635E+02	-3.33852E+02	-1.45291E+01	3.06617E+00	540.000	0.627	-0.614	0.000
733	3.46436E-02	-3.71653E-02	-1.29287E-03	2.1542E-02	10.000	0.004	-0.004	0.000
734	3.10455E-02	-3.45693E-02	-1.32367E-03	2.21188E-02	10.000	0.004	-0.004	0.000
735	3.40717E+02	-3.34556E+02	-1.45495E+01	3.08074E+00	540.000	0.631	-0.620	0.000
736	1.94574E-02	-3.44025E-02	-1.13444E-03	2.17444E-02	10.000	0.004	-0.004	0.000
737	3.75555E-02	-3.87957E-02	-1.30212E-03	3.00212E-02	10.000	0.004	-0.004	0.000
738	1.70202E+02	-1.67818E+02	-7.30709E+00	1.61469E+00	270.000	0.630	-0.622	0.000
739	2.70715E-02	-6.00034E-02	-2.41475E-03	-3.73245E-02	694.363	0.000	-0.000	-0.000
740	-6.15323E-02	-2.93343E-01	-4.02364E-03	-4.61597E-02	694.363	-0.000	-0.000	-0.001
741	-2.39495E-01	-1.46424E-01	6.29997E-04	-6.03997E-02	694.363	-0.000	-0.000	-0.001
742	-1.92627E-01	-2.46343E-01	-1.49435E-03	-7.32793E-02	694.363	-0.000	-0.000	-0.001
743	-2.50394E-01	-2.61506E-01	-3.08649E-04	-8.11936E-02	694.363	-0.000	-0.000	-0.001
744	-2.53125E-01	-2.67597E-01	-1.24215E-04	-8.26304E-02	694.363	-0.000	-0.000	-0.001
745	-2.66723E-01	-2.04949E-01	1.71591E-03	-7.73A32E-02	694.363	-0.000	-0.000	-0.001
746	-2.01869E-01	-1.09525E-01	2.56511E-03	-6.62709E-02	694.363	-0.000	-0.000	-0.001
747	-1.04862E-01	1.17417E-01	6.17439E-03	-5.07A30E-02	694.363	-0.000	-0.000	-0.001
748	1.21776E-01	1.46871E-02	-2.97469E-03	-3.70532E-02	694.363	0.000	0.000	-0.001
749	-1.15429E+01	-7.00797E+01	-1.22151E+00	1.73119E+00	270.000	-0.050	-0.269	0.000
750	1.75A9AF-02	-1.93910E-02	-6.30649E-04	1.27074E-02	10.000	0.002	-0.002	0.001
751	1.57705E-02	-1.39432E-02	-5.06765E-04	4.15455E-02	10.000	0.002	-0.001	0.000
752	2.2442AE+02	-2.15112E+02	-9.92450E+00	3.0A945E+00	540.000	0.419	-0.435	0.000
753	1.76070E-02	-1.96733E-02	-6.35649E-04	1.616A0E-03	10.000	0.002	-0.002	0.000
754	1.37A11E-02	-1.19039E-02	-4.38063E-04	4.75822E-02	10.000	0.001	-0.001	0.000
755	2.13457E+02	-2.29344E+02	-9.56764E+00	2.9073AF+00	540.000	0.395	-0.425	0.000
756	1.75A7AF-02	-1.94970E-02	-6.3230AF-04	-5.47592E-04	10.000	0.002	-0.002	-0.001
757	1.33574E-02	-1.1A174E-02	-4.29362E-04	4.76588E-02	10.000	0.001	-0.001	0.000
758	2.15261E+02	-2.30156E+02	-9.62327E+00	2.44420E+00	540.000	0.399	-0.426	0.000
759	1.76619E-02	-1.92092E-02	-6.2A753E-04	2.43549E-06	10.000	0.002	-0.002	0.000
760	1.32501E-02	-1.20981E-02	-4.3231AF-04	4.64120E-02	10.000	0.001	-0.001	0.000
761	2.20909E+02	-2.32917E+02	-9.40494E+00	2.43509E+00	540.000	0.409	-0.431	0.000
762	1.75A62E-02	-1.46444E-02	-6.17A37E-04	2.730A3E-03	10.000	0.002	-0.002	0.000
763	1.33701E-02	-1.27736E-02	-4.45482E-04	4.34993E-02	10.000	0.001	-0.001	0.000
764	2.29707E+02	-2.36639E+02	-1.00668E+01	2.82A18E+00	540.000	0.425	-0.438	0.000
765	1.75974E-02	-1.8116AE-02	-6.09077E-04	5.33421E-03	10.000	0.002	-0.002	0.001
766	1.3479AE-02	-1.34406E-02	-4.59123E-04	4.09932E-02	10.000	0.001	-0.001	0.000
767	2.37531E+02	-2.40250E+02	-1.03225E+01	2.34A57E+00	540.000	0.440	-0.445	0.000
768	1.7586AE-02	-1.75257E-02	-5.9A783E-04	8.56524E-03	10.000	0.002	-0.002	0.001
769	1.369A3E-02	-1.41A67E-02	-4.75570E-04	3.41575E-02	10.000	0.001	-0.001	0.000

770	2.45646E+02	-2.47598E+02	-1.05710E+01	2.47290E+00	543.000	.453	-0.451	.000
771	1.77090E-02	-1.71625E-02	-5.94690E-04	1.07672E-02	10.000	.002	-0.002	.001
772	1.38993E-02	-1.47240E-02	-4.88159E-04	3.66192E-02	10.000	.001	-0.001	.000
773	2.51459E+02	-2.46079E+02	-1.07494E+01	2.92150E+00	540.000	.466	-0.466	.000
774	1.74277E-02	-1.69220E-02	-5.92602E-04	1.24444E-02	10.000	.002	-0.002	.001
775	1.42991E-02	-1.51854E-02	-5.02445E-04	3.51571E-02	10.000	.001	-0.001	.000
776	2.55035E+02	-2.47643E+02	-1.08605E+01	2.93756E+00	543.000	.472	-0.472	.000
777	1.43760E-02	-1.76257E-02	-6.13449E-04	1.05939E-02	10.000	.001	-0.001	.000
778	1.41944E-02	-1.44203E-02	-4.94446E-04	3.46651E-02	10.000	.001	-0.001	.000
779	1.26277E+02	-1.23990E+02	-5.40710E+00	1.57279E+00	273.000	.463	-0.463	.000
780	1.79155E-02	5.62352E-02	1.06444E-03	-3.37671E-02	694.363	.000	-0.000	.000
781	6.99451E-02	-7.43414E-02	-4.12411E-03	-2.94919E-02	694.363	.000	-0.000	.000
782	-6.43776E-02	-5.56525E-02	3.53474E-04	-3.57571E-02	694.363	.000	-0.000	.000
783	-4.63034E-02	-6.34044E-02	-4.86240E-04	-4.23424E-02	694.363	.000	-0.000	.000
784	-5.41632E-02	-7.50352E-02	-5.79777E-04	-4.66633E-02	694.363	.000	-0.000	.000
785	-6.48169E-02	-7.10377E-02	-1.72401E-04	-4.95639E-02	694.363	.000	-0.000	.000
786	-6.71613E-02	-6.14190E-02	-3.49367E-05	-4.70276E-02	694.363	.000	-0.000	.000
787	-6.49957E-02	-2.75178E-02	7.35494E-04	-4.27604E-02	694.363	.000	-0.000	.000
788	-1.16443E-02	2.59642E-02	1.04590E-03	-3.64262E-02	694.363	.000	-0.000	.000
789	3.73602E-02	-6.20670E-04	-1.05502E-03	-3.11374E-02	694.363	.000	-0.000	.000
790	9.16593E+00	-5.73274E-03	-7.50365E-01	1.63767E+00	273.000	.034	-0.034	.000
791	5.76415E-03	-4.55440E-04	-1.49297E-04	4.12440E-03	10.000	.001	-0.001	.000
792	1.27774E-03	-7.02478E-03	-3.67063E-05	4.25279E-02	10.000	.000	-0.000	.000
793	6.71770E+01	-5.69456E-03	-2.96499E+00	2.47729E+00	543.000	.174	-0.174	.000
794	5.75459E-03	-2.84406E-04	-1.47305E-04	4.35164E-03	10.000	.001	-0.001	.000
795	9.22142E-04	-5.52452E+01	-2.06447E-05	4.37593E-02	10.000	.000	-0.000	.000
796	3.74021E+01	-5.54736E-03	-2.01114E+00	2.70014E+00	543.000	.070	-0.070	.000
797	4.91565E-03	-1.69447E-04	-1.74425E-04	3.59542E-03	10.000	.000	-0.000	.000
798	7.14464E-04	-1.69447E-04	-1.49719E-05	4.12440E-03	10.000	.000	-0.000	.000
799	3.77511E+01	-5.52117E+01	-2.00449E+00	4.12440E-03	10.000	.000	-0.000	.000
800	4.94641E-03	-5.47449E-03	-1.74457E-04	2.67943E+02	543.000	.070	-0.070	.000
801	6.04011E-04	-1.94141E-04	-1.37445E-05	3.14249E-03	10.000	.000	-0.000	.000
802	4.17441E+01	-5.47070E+01	-2.20544E+00	3.97900E-02	10.000	.000	-0.000	.000
803	5.13764E-03	-5.36047E-03	-1.77311E-04	2.61193E+00	543.000	.041	-0.041	.000
804	5.23702E-04	-2.97011E-04	-1.77311E-04	3.20970E-03	10.000	.001	-0.001	.000
805	5.47717E+01	-6.37472E+01	-1.99091E-05	3.97540E-02	10.000	.000	-0.000	.000
806	5.11474E-03	-5.37472E+01	-2.56144E+00	2.61156E+00	543.000	.101	-0.101	.000
807	4.46470E-04	-5.25867E-03	-1.76959E-04	3.13313E-03	10.000	.001	-0.001	.000
808	6.56351E+01	-6.92144E+01	-1.45677E-05	3.37243E-02	10.000	.000	-0.000	.000
809	5.21446E-03	-5.47527E-04	-2.91741E+00	2.67072E+00	543.000	.122	-0.122	.000
810	4.71404E-04	-5.16319E-03	-1.77078E-04	3.67966E-03	10.000	.001	-0.001	.000
811	7.7673E+01	-5.47527E-04	-1.61479E-05	3.37567E-02	10.000	.001	-0.001	.000
812	5.37174E-03	-5.17231E-03	-3.24445E+00	2.65677E+00	543.000	.143	-0.143	.000
813	4.11493E-04	-6.76296E-04	-1.74273E-04	4.07651E-03	10.000	.001	-0.001	.000
814	9.51869E+01	-7.44926E+01	-1.45544E-05	3.99890E-02	10.000	.000	-0.000	.000
815	5.41367E-03	-5.10744E-03	-3.54492E+00	2.70474E+00	540.000	.154	-0.154	.000
816	5.07960E-04	-4.07170E-04	-1.79423E-04	4.63119E-03	10.000	.001	-0.001	.000
817	9.7414E+01	-9.14574E+01	-3.71170E+00	3.99954E-02	10.000	.000	-0.000	.000
818	5.45614E-03	-5.22900E-03	-1.92214E-04	2.72240E+00	540.000	.167	-0.167	.000
819	5.77340E-04	-7.77044E-04	-2.30944E-05	4.92324E-03	10.000	.001	-0.001	.000
820	4.16359E+01	-3.02504E+01	-1.74755E+00	4.05124E-02	10.000	.000	-0.000	.000
821	0.	0.	0.	1.39971E+00	273.000	.154	-0.154	.000
822	0.	0.	0.	0.	0.	0.	0.	0.
823	0.	0.	0.	0.	0.	0.	0.	0.
824	0.	0.	0.	0.	0.	0.	0.	0.
825	0.	0.	0.	0.	0.	0.	0.	0.
826	0.	0.	0.	0.	0.	0.	0.	0.
827	0.	0.	0.	0.	0.	0.	0.	0.
828	0.	0.	0.	0.	0.	0.	0.	0.
829	0.	0.	0.	0.	0.	0.	0.	0.
830	0.	0.	0.	0.	0.	0.	0.	0.

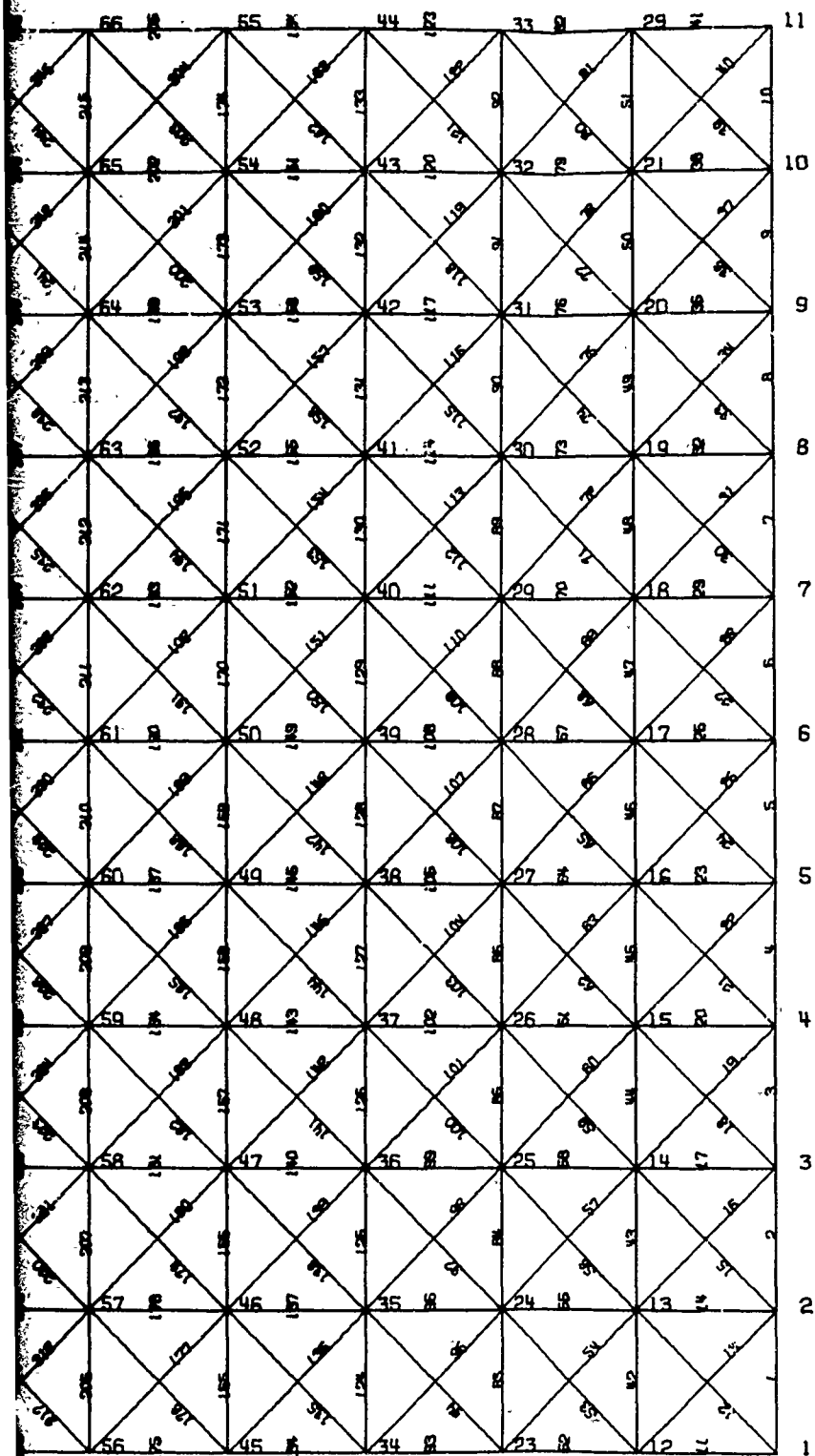
REFERENCES

1. Krapf, Wiley E., *Analysis of 55-Foot Earth-Covered Shelter*, unpublished report for Wonder Trussless Buildings, Inc., Chicago, Illinois, January 1966.
2. Krapf, Wiley E., *Analysis of 48-Foot Arch Span--Earth Covered*, unpublished report for Wonder Trussless Buildings, Inc., Chicago, Illinois, November 1967.
3. Webb, R. M., *Evaluation of a 40-Foot by 100-Foot Elliptical Arch Utility Building*, Technical Report 135, U.S. Naval Civil Engineering Laboratory, Port Hueneme, California, June 1961.
4. Webb, R. M., *Evaluation of a 60-Foot by 100-Foot Frameless Arch Utility Building*, Technical Report 159, U.S. Naval Civil Engineering Laboratory, Port Hueneme, California, September 1961.
5. Piepenburg, Dwayne D., *Interim Report on the Evaluation of a Steel Arch Protective Shelter*, Project 1597, Task 01, Civil Engineering Branch Development Division, Air Force Weapons Laboratory, Kirtland Air Force Base, N. Mex., October 1966.
6. Smith, Jimmy H., *A Method for Analyzing Nonlinear Plate Structures*, Ph.D. dissertation, The University of Arizona, Tucson, Arizona, University Microfilms Inc., June 1968.
7. Richard, R. M., and Goldberg, J. E., "Analysis of Nonlinear Structures: Force Method," *Journal of the Structural Division*, ASCE, Vol. 91, No. ST6, Proc. Paper 4553, December 1965, pp. 33-48.
8. Goldberg, J. E., and Richard, R. M., "Analysis of Nonlinear Structures," *Journal of the Structural Division*, ASCE, Vol. 89, No. ST4, Proc. Paper 3604, August 1963, pp. 333-351.
9. Hrennikoff, A., "Solutions of Problems of Elasticity by the Framework Method," *Journal of Applied Mechanics*, ASME, Vol. 63, New York, N.Y., December 1941.
10. Yettram, A. L., and Husain, H. M., "Grid Framework Method for Plates in Flexure," *Journal of the Engineering Mechanics Division*, ASCE, Vol. 91, No. EM3, Proc. Paper 4361, June 1965, pp. 53-64.

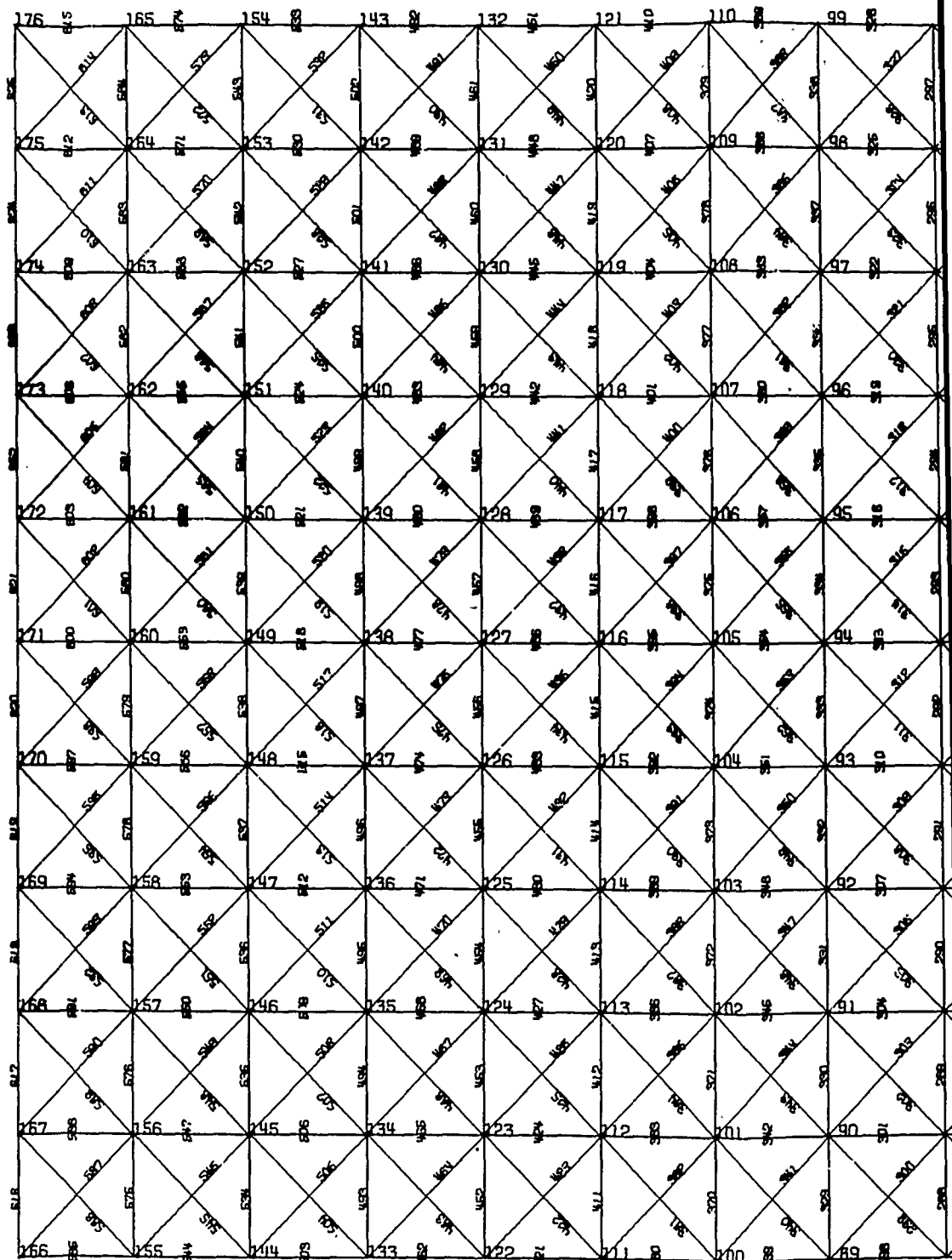


A

10 x 10 GRID SY:

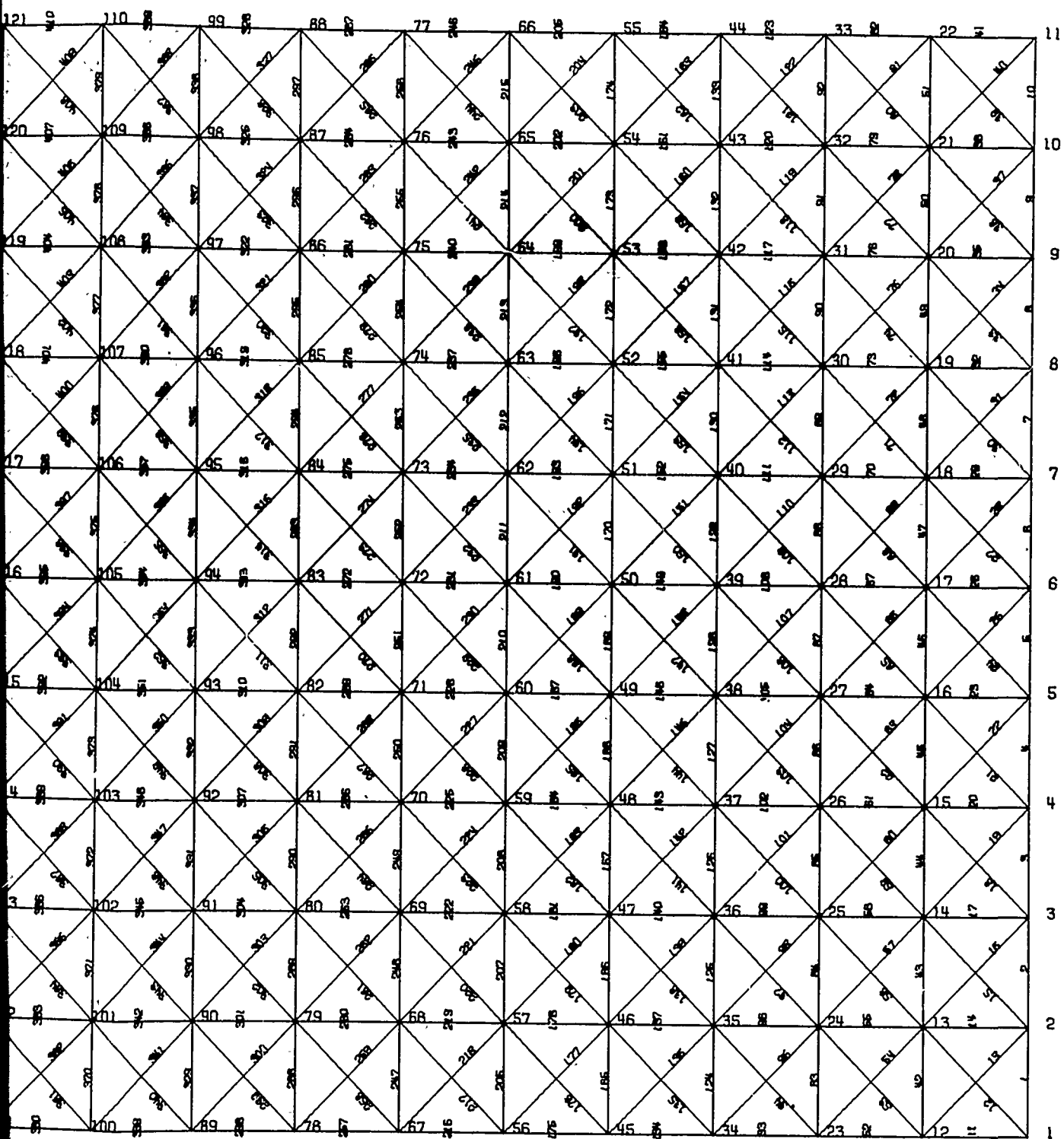


10 x 10 GRID SYSTEM

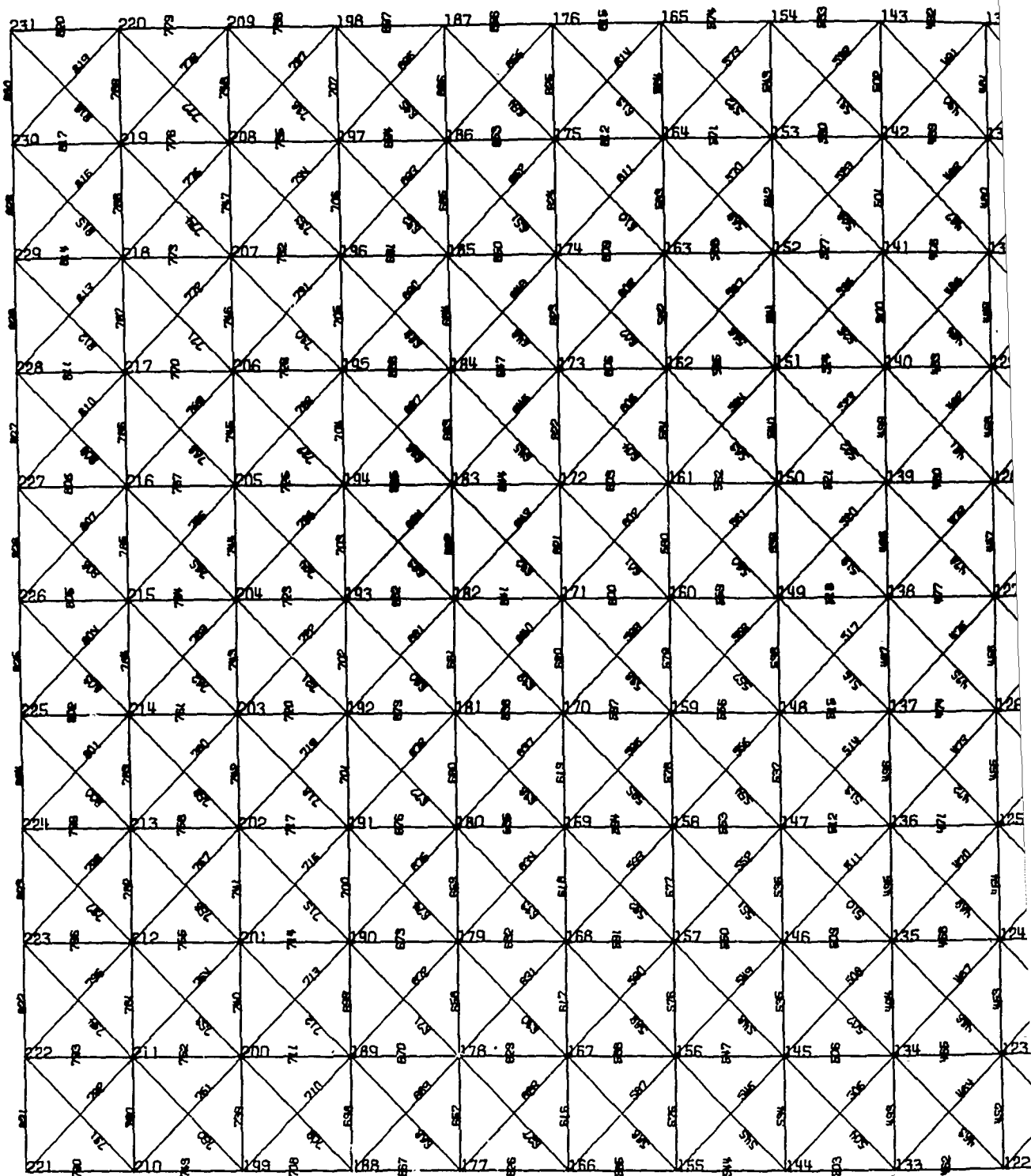


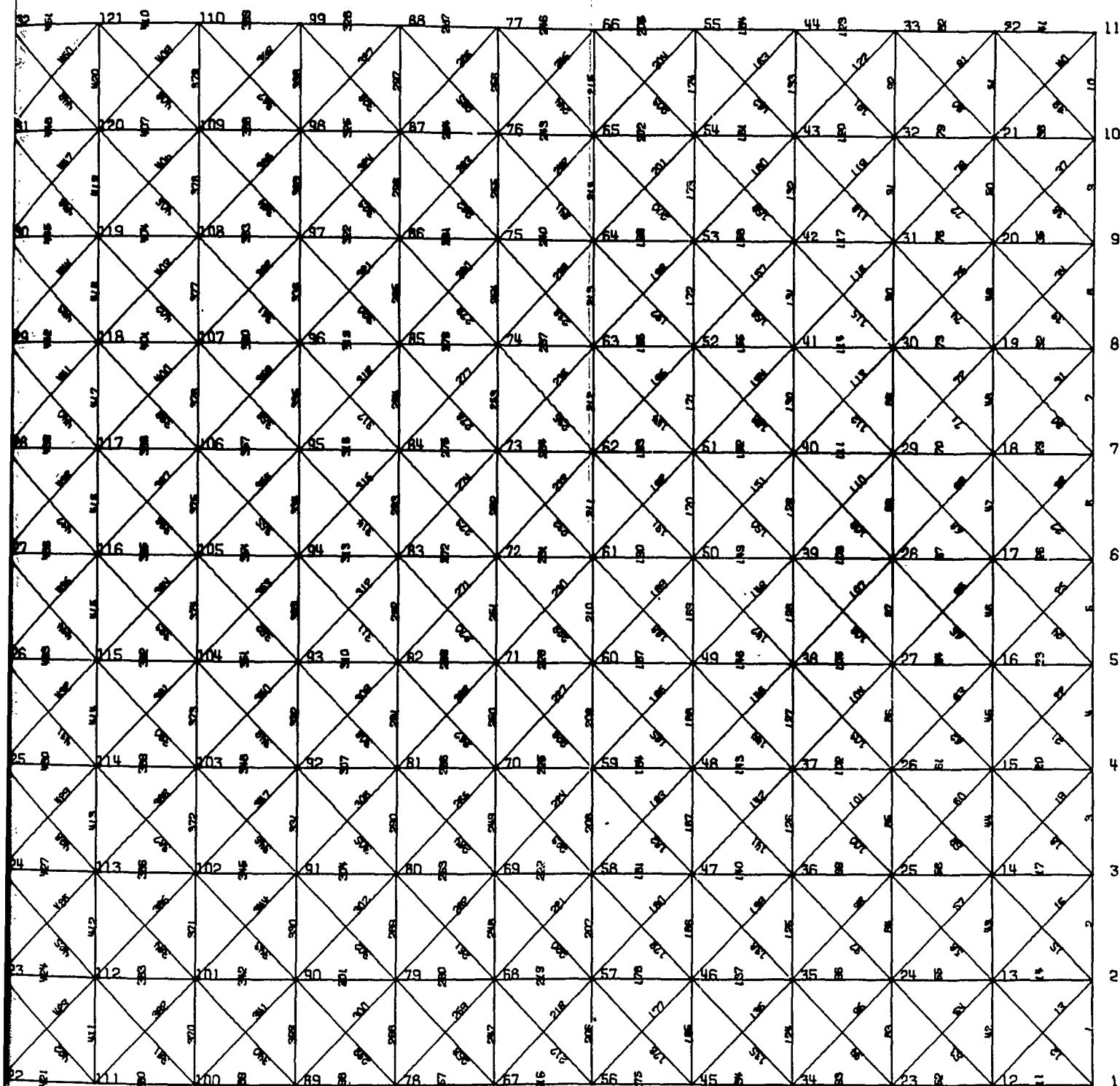
X

10 x 15 GRID SYSTEM



B





10 x 20 GRID SYSTEM